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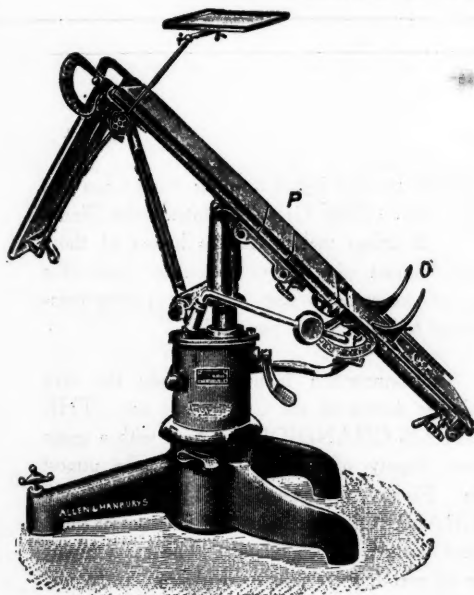
MEDICAL JOURNAL
OF AUSTRALIA

VOL. I.—14TH YEAR.

SYDNEY: SATURDAY, JUNE 4, 1927.

No. 23.

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JOINT TUBERCULOSIS.

By RUSSELL A. HIBBS, M.D. AND ALAN DE F. SMITH, M.D.,
New York.

[From the Clinic of the New York Orthopaedic
Dispensary and Hospital.]

THERE is perhaps no other class of surgical cases in which the diagnosis is so often faulty and in which the treatment is so archaic and ineffectual as in that of joint tuberculosis. There appears to be in general an incomprehension of the seriousness of these lesions and a tendency to let them go. In the United States no survey ever has been made to determine the number of such patients. All the information at hand is that of the number treated at a few of the larger hospitals. Statements have been made in recent years that there is a marked decrease in the incidence, such would be expected from the campaign now on foot against pulmonary tuberculosis, but there is no proof that this is so. Certain it is that these patients number many thousands and that the problem still is a very important one meriting far more consideration than it has received. If the amount of destruction that finally occurs in the average tuberculous joint were accomplished in a period of days or weeks, instead of months or years, there would be little disposition to trifle with a case. Probably it is the insidiousness of the disease that has caused the medical profession to regard it with complacency and has blinded it to the fact that in most cases although the final result is long in arriving, it is nevertheless extremely bad.

For years the pathology of tuberculous joints has been a subject of controversy in this country, but the general belief has been and still is, that the disease in practically all cases starts in the bone in the region of the joint and involves the latter only secondarily. We believe that this conception has been the chief factor in the failure to diagnose the condition in its early stages. In Europe it long has been recognized that the starting point may be either in the bone or the synovial membrane, but there also the belief is prevalent that the former is much more common.

In America a paper by Nichols in 1896, describing one hundred and twenty specimens of tuberculous joints from autopsies and operations, stated that in all of them the disease began in the bone. This has been accepted as authoritative and has been a deciding influence throughout the literature. This received confirmation in a paper by Allison in 1920 in which he reported on more than eighty cases, specimens of which were obtained at operation and in all of which he believed the disease started in the bone. As a matter of fact all of these specimens were from late cases and all that can be said of them is that the bone was involved. There is no proof that the disease started there. Reports by Ely and Rogers giving evidence of primary synovial tuberculosis attracted but little attention.

At the New York Orthopaedic Hospital the policy of operating on many of the cases early, both to establish the diagnosis and as a therapeutic

measure, has given us in the last few years an unusual opportunity to decide this question in a fairly large number of cases. In twenty early cases recently operated upon seventeen unquestionably began in the synovial membrane and only three in bone. It is not intended to imply that this is the proportional incidence in all cases, but increasing experience tends to confirm our belief that, in the knee joint at least, the majority of cases have their origin in the synovia. The majority of these cases were knee joints, but there were one of the ankle and two of the foot. Both children and adults were included. This question is of more than academic interest because it seems probable that the course of the disease is much slower in the primary synovial type and that in many such cases several years elapse before the bone is involved.

In the advanced stages of the disease the diagnosis is fairly easy, although it is surprising to find how many errors there are even among these cases. In the synovial form, however, it is extremely difficult to make a diagnosis with any certainty in the first two years. The percentage of error in diagnosis is very high. Ely was impressed by this in examining specimens sent to him as tuberculous joints. Of two hundred and eight patients treated for tuberculosis of the hip at the Country Branch of the New York Orthopaedic Hospital from 1901 to 1921 it subsequently was found that forty-six patients or 22% did not have tuberculosis. Of seventy cases of supposed tuberculosis of the knee, seven probably were wrongly diagnosed. This situation probably obtains to an equal degree in other hospitals and in the rural districts it perhaps is worse.

In a series of thirty-nine cases proved by operation to have tuberculous joints, fourteen were incorrectly diagnosed on admission to our dispensary and practically none had been diagnosed previous to admission. In the majority of cases the diagnosis is made only late in the disease. In the care of these thirty-nine patients the average period between the onset and the time when tuberculosis was suspected was thirty-two months. The reason for this is that the physical signs are not pronounced, consisting often of only slight or moderate swelling intermittent in character and muscle spasm occurring often only at the extreme ranges of motion and so slight as to be easily overlooked. Pain is not a prominent characteristic. This picture may be produced by a simple synovitis or arthritis and is likely to make little impression on one who thinks of tuberculosis of joints only in terms of destruction of bone.

The procedure at the New York Orthopaedic Hospital in a case suspected of having a tuberculous joint is now, after making a careful physical examination, to have X rays, blood count, Mantoux and Wassermann tests. If there is fluid in the joint in sufficient quantity to be aspirated, this is done and some of the fluid is injected into a guinea pig. This is the only laboratory test which positively establishes a diagnosis of tuberculosis of a joint. If the pig fails to develop tuberculosis, however, it by

no means excludes the possibility. A positive tuberculin test means only that the individual has had tuberculosis and is not specific for any given lesion. If it is negative, it should be repeated several times. Several negative tests are significant, provided the patient is not debilitated and has no acute disease which might negative this reaction. It is our custom to use both bovine and human tuberculin. In most cases a positive reaction to both is obtained, but in some the reaction to the bovine is stronger than to the human and a few give a positive reaction to bovine and not to human. This occurs more frequently than the reverse.

An effort was made in a series of cases in which the diagnosis could be established absolutely by operation, to determine the value of the subcutaneous injection of tuberculin for the purpose of provoking a general and final reaction. It was found that in small doses of 0.05 to 0.3 milligramme cases of tuberculosis might fail to give a reaction and that if the dose were pushed to 3 or 5 milligrammes, cases of arthritis *et cetera* would give a positive reaction. The test was therefore abandoned as worthless.

The usual X ray findings in the early cases are either simply those of synovial effusion or synovial thickening together with decalcification of bone. Somewhat later thinning of the joint space occurs. It is interesting that in the cases of knee joint tuberculosis that have progressed for six months or a year, relative enlargement of the centre of ossification of the epiphysis of the femur and tibia and of the patella is quite usual. None of these changes is pathognomonic of tuberculosis. After all of our laboratory tests then we are frequently left still in doubt as to the exact condition.

The results of the widespread errors in diagnosis in these cases have been threefold. (i) Many cases of tuberculosis go untreated for long periods and thus progress to a dangerous degree or to a point which makes the cure correspondingly difficult. (ii) Many cases which are not tuberculous are treated as such and are subjected to long periods of immobilization, recumbency, hospitalization and separation from their families and occasionally the function of the joint is compromised. (iii) The statistics about the results of conservative methods of treatment are entirely unreliable and misleading. Many so-called cures are not cases of tuberculosis to begin with.

For this reason it is the practice at the Orthopaedic Hospital in all cases in which a careful study has failed to make possible a positive diagnosis, to perform an exploratory operation. In the case of the knee joint a medial longitudinal incision is carried down through the capsule and synovial membrane and the patella is retracted. In most instances a good view of the whole anterior portion of the joint is afforded. In the very few cases in which it is necessary, a lateral incision may be made also. Small pieces of synovial membrane are removed from various parts of the joint. One or two are implanted in the abdominal wall of a guinea pig and the remainder are sectioned. Great care

should be taken to select representative portions of the synovia and not to overlook an active process hidden away in some nook or corner. Although the gross appearance of a tuberculous synovial membrane usually is quite characteristic, this must not be relied upon, but the result must await the microscopical sections.

The incision is sutured without drainage. An old and well established tradition holds that opening of the knee joint except in the most urgent circumstances is unjustifiable. This harkens back to the days of antiseptic surgery or before. No well trained surgeon of today hesitates to remove a damaged semilunar cartilage. We believe that the indications for exploring a suspected tuberculous joint are more urgent than this and the reaction from the operation is less severe.

Whatever one's belief about the proper method of treating a tuberculous joint, he should never apply any form of immobilization until he is absolutely certain of the diagnosis. Very soon after a brace or plaster has been applied muscle atrophy, limitation of motion and decalcification of bone appear and these all tend to confuse and obscure the diagnosis. We believe that in a doubtful early case the patient should be kept off his feet as much as possible and, if necessary, admitted to a hospital for observation and that then, if the symptoms fail to disappear, exploration should be resorted to.

Much attention is now being paid to heliotherapy in the treatment of tuberculosis. After studying our cases so treated we are forced to the conclusion that in most of them at least it has had no effect upon the progress of the disease. In order to make certain that a tuberculous joint is healed and will not recur, absolute elimination of motion is essential and this can be obtained only by arthrodesis or fusion of the joint. Much misunderstanding of this disease has arisen from the fact that a focus may remain latent for so many years ready to flare up again after some traumatism or lessening of the individual's resistance. Recently a woman who had been treated at the Orthopaedic Hospital twenty-five years previously for tuberculosis of the knee and who had been apparently cured with a limited range of motion, returned with swelling, tenderness and muscle spasm following a fall. Sections of the tissue obtained at operation showed a very active tuberculosis. There have been many other instances of recurrence at the end of five or ten years of inactivity. Undoubtedly the majority of such cases are regarded as cured. On the other hand, we never have seen a recurrence in a knee that was arthrodesed.

This opinion is based on the experience of the Orthopaedic Hospital with a large number of cases extending over many years. These patients were hospitalized at the Country Branch where every facility was available for their proper care for an average of six years. Under these conditions and with conservative treatment 20% of the knee joint cases apparently recovered with a fairly useful range of motion. How many of these will recur is not known. The results in the cases of hip joint

tuberculosis were much worse. Is it worth while for a child to spend six years in a hospital away from its family for a 20% chance of getting a useful joint and with the probability of recurrence even then in doubt? Is it not better to arthrodesis the joint at once and be assured that within a year a dangerous disease will be stopped? The effect of long hospitalization on the psychology of the child cannot be disregarded.

It is possible without question to fuse a spine at any age. More than seven hundred operations have been performed in cases of tuberculosis of the spine with only one operative mortality. This patient died forty-eight hours after operation of a thrombosis of the brachial vein. The results have been excellent in spite of the fact that all cases were operated on without selection. By removing the articular cartilage from the femur, tibia and patella, fitting the latter into a mortise between the femur and tibia and stretching the periosteum of the patella and that of the tibia the knee joint can be arthrodesed in all cases at six years and in some at four. The growth of the limb is in no way interfered with, because the epiphyseal cartilages are left intact. As a result of these operations the average stay in hospital of these patients has been reduced to eighteen months and the percentage of cures has been raised to seventy in the spines and to between ninety and a hundred in the knees. If the old, neglected cases are excluded, the percentage of cures becomes much higher.

The most discouraging cases of all have been the tuberculous hips. This joint is subject to the entire weight of the body and it is very difficult to immobilize it. In the past in spite of prolonged treatment the results have been very bad. A method has now been developed by which this joint can be arthrodesed in children and the results so far have been very satisfactory.

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PROFESSOR BLAIR BELL'S LEAD TREATMENT OF MALIGNANT DISEASE.¹

By BRIAN H. SWIFT, M.C., B.A., M.B., B.C. (Camb.),
F.R.C.S. (Edin.),
Adelaide.

IN August, 1926, I had decided to go to Liverpool with the intention of staying a few days to see the Gynæcological Department of the University and if possible to see Professor Blair Bell's work. However on arrival I found that Professor Blair Bell had arranged a two day demonstration of his lead treatment of malignant disease for the members of the visiting American Gynæcological Society. I met Blair Bell's chief assistant, Dr. Cunningham, and found that we had been up at Cambridge together and he very kindly invited me to stay on and see the lead treatment.

I might add that the American gynæcologists left Liverpool thoroughly impressed with Blair Bell's work and most enthusiastic over his results. There were also present at this demonstration several leading British gynæcologists whom I met at a later date, when they told me that they also had been very impressed with what they had seen at Liverpool.

Unfortunately for me, Blair Bell left for a holiday as soon as this demonstration was finished. However I stayed on and Dr. Cunningham was most kind and I was able to see all the patients and follow up their treatment.

There were two private nursing homes of about twenty beds each in Rodney Street which were solely used for patients with malignant disease and it was there that most of the treatment was done. Every patient was treated with lead and some with X rays as well, but Professor Bell did not use radium. One nursing home was next door to Blair Bell's private house and he, as it were, lived in an atmosphere of malignant disease as his house had doors leading directly into the nursing home. The organization was very complete. There was the usual staff of physician, surgeon, pathologist *et cetera* and also a full time assistant in a laboratory in the basement of one home who tested every day the urine and blood of every patient. There was also a whole time man in the Gynæcological Department of the University who did all the pathological work and collected the notes and records of each case. It was possible at any time to obtain slides, lantern as well as microscopical, photographs, charts *et cetera* of any case.

At the last Annual Meeting of the British Medical Association which was held at Nottingham,

¹ Read at a meeting of the South Australian Branch of the British Medical Association on April 28, 1927.

Professor Blair Bell and his associates read a series of papers on this work at Liverpool. They were published in *The British Medical Journal*, November 20, 1926, and I would refer anyone who is interested to these papers. They give a very good idea of the scientific side of the work.

I will now give shortly the method of procedure of a patient who wishes to have lead treatment. This procedure will illustrate the thoroughness and carefulness of Professor Blair Bell.

Firstly all patients have to be sent by their own doctor. If, however, a patient writes direct to Blair Bell the following standard letter is sent back:

Dear Sir or Madam,

Your letter has been received and in reply we beg to state that we cannot accept cases for treatment unless they are suitable and able to come to Liverpool for consultation in the first instance. It is, therefore, necessary for you to consult your own doctor, in order that if he sees fit he may write to us himself.

We strongly urge you to be guided by his advice.

Yours faithfully,

W. BLAIR BELL,
Director.

The patient then goes to his own doctor who writes full details to Blair Bell of the case. The following standard letter is then sent to the doctor:

Dear Sir,

Thank you for your letter of the——.

You will understand that we are engaged in a scientific investigation, and have so far regarded our clinical work as a test of the findings obtained in the laboratory. We do not pretend, and never have pretended, that we have a "cure for cancer." Nevertheless, the ultimate aim of all such work is that, and we are prepared to take suitable cases that can come for consultation in the first instance, provided they are fully informed:

- (1) That consultations are arranged in order that it may be determined whether the case is suitable for further investigation. A consultation does not mean *ipso facto* that the patient will be taken for treatment.
- (2) That the treatment itself may be dangerous.
- (3) That the treatment is experimental in nature.
- (4) That there is no guarantee whatsoever as to the result.
- (5) That the patients must, if they come, place themselves unreservedly in our hands, and continue the treatment so long as we think it advisable.
- (6) That accessory treatment, such as X-rays and operation, may be necessary.
- (7) That, if an operation has been performed, a section must be sent in advance.
- (8) That all fees are handed over to the Cancer Research Committee.

Yours very truly,

W. BLAIR BELL,
Director.

This letter relieves Blair Bell of a great deal of responsibility. Sometimes the doctor writes for details of lead treatment, so that he can give it himself, and in these cases the following is sent to him:

Dear Sir,

Thank you for your letter of the——.

It is impossible to give you any adequate account in a letter of the method of treatment adopted. It involves a detailed preliminary investigation of all body fluids, and

one also needs to have some idea of the size of the tumour to be treated. So far we have only succeeded in preparing a colloidal suspension of lead which will remain stable for a short time. Only freshly prepared suspensions are used by us; you will see, therefore, that it is impossible to send you any.

I hope that you will appreciate our difficulty in this matter; were it possible, I would be only too delighted to help you in any way.

Appended is a list of the publications by members of the Liverpool Cancer Research Staff.

Yours very truly,

W. BLAIR BELL,
Director.

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Every patient on arrival for treatment has first to be seen by Blair Bell who decides whether the condition is a suitable one or not. Professor Blair Bell told me that people got very indignant with him when he refused a patient. He mentioned the case of a boy who had arrived the previous week from America with a very advanced malignant growth. He had refused to treat the boy and the parents had taken the boy back to the hotel where he had died the next day. The great majority of patients who have been treated, were suffering from very advanced malignant disease and the lead had only been used as it were as a last resource, hence the number of deaths was enormous. The present rate of five year cure is about one in five of all cases treated.

If the patient was considered to be suitable, a very complete general examination was made before treatment was commenced and if no section of the growth had been sent with the patient, definitely proving that it was a malignant condition, then a piece of growth was excised for examination. This was done so as to make certain that all conditions were really malignant.

The examination included a very thorough test of the kidney function and also the estimation of hæmoglobin and blood counts.

At the present time practically all patients are operated on if possible before treatment is begun. By this I mean that as much as possible of the growth is removed. For instance, in advanced carcinoma of the cervix a vaginal hysterectomy is performed, although it necessitates cutting through carcinomatous parametrium or again in advanced

inoperable breast tumours the breast and as much of the axillary glands *et cetera* are removed. The reason for this is that it was found that the lead caused massive necrosis of the tumour and the resultant toxic products entering into the circulation of an already weakened and enfeebled patient were apt to have fatal results.

As soon as the patient has recovered from this operation, namely on about the fourth or fifth day, the first intravenous injection of lead is given. The preparation is a slightly hypertonic colloid suspension of lead and is called S.7 and contains 0.5% of lead. Twenty cubic centimetres are given to patients whose blood and kidneys, as shown by tests, are normal. In doubtful cases smaller doses are given. The preparation of the patient consists of copious drinks of imperial drink or barley water for two or three days before and after the injection and on the day of injection no food for three hours before or after. It was found that a large percentage of lead was excreted by the kidneys, hence the giving of fluids. The injection is usually given between two and three o'clock in the afternoon. The lead preparation is made in the Biochemical Laboratory of the University in the morning as this S.7 oxidizes very quickly when exposed to the air and is then useless.

In the evening following the injection one gramme (fifteen grains) of freshly prepared calcium lactate is given by mouth as a routine. It has been found that calcium locks up the lead in the tissues and so lessens the toxic effects. At present a preparation called "Parathormone," made by Lilly, of America, is being tried. It is a parathyroid preparation and fixes calcium.

The immediate reaction in some cases is in the form of an anginal attack, for example dyspnoea, slow pulse, headaches and then later vomiting and angina. Amyl nitrite has been used with varying success. A few hours after injection the patient complains of pain at the site of the growth. This is a most interesting point as it demonstrates that the lead is acting on the growth. Later the patient becomes poisoned by the lead and various toxic reactions are liable to take place. These are described in detail in *The British Medical Journal*, November 20, 1926, and I will not mention them here beyond stating that further injections of lead have been refused by some patients owing to the excessive vomiting which the previous injections had caused. Some patients had vomited all food for over a week. Glucose and "Insulin" was being tried for this excessive vomiting. For the colic morphine and atropine were used.

This initial intravenous injection of twenty cubic centimetres of the 0.5% suspension was given into a vein in the arm by means of a "Record" syringe with an interceptor which is a glass attachment between the needle and the syringe.

Another injection was given in a week or ten days' time depending on the condition of the patient and more especially on the condition of the blood and kidneys.

The total dose aimed at was 0.6 gramme or one hundred and twenty cubic centimetres of this suspension.

This routine was carried on for a month and the patient was given a rest of a month before being given the rest of the injections. Patients were usually in bed, but were allowed up if they felt well enough.

At the infirmary the large initial dose of fifteen cubic centimetres to twenty cubic centimetres was given and the patient stayed in hospital for one or two nights. A week later injections of five cubic centimetres only, were being given twice a week to the patients as out-patients.

Blood and urine tests were always done before every injection.

The results of this treatment are most encouraging and I saw several excellent results. I will refer you again to *The British Medical Journal* for a table of these results, but I might say that I actually saw a number of the patients mentioned as cured and their condition was really marvellous.

The results of giving the lead after complete operations for malignant growth are difficult to arrive at, but it is now advocated that lead injections be given after all operations for malignant growths as a prophylactic measure against recurrences.

The main difficulty at present is the preparation of the lead. Oxidation takes place very rapidly and so the lead has to be made fresh for practically every injection. During the last year the Crookes Laboratories had prepared some colloid lead which they called "Choriotope." They had managed to make the 0.5% suspension more stable and oxidation did not take place and it was supposed to last for at least three months without deterioration. The chemists had added more gelatine and the lead was in a solid state and had to be warmed and so made fluid before injection. This "Choriotope" had been used in Liverpool and had given satisfactory results which were thought to be as good as the results of S.7.

Professor Blair Bell has unfortunately been condemned for keeping his work on malignant disease so secret and for not supplying lead to outside surgeons and doctors. Numerous letters have appeared in the medical journals. Blair Bell realized this, but said that he had not had sufficient experience with the lead to warrant it being recommended to the profession and he felt that as it was such a toxic substance it would be better if its use were restricted, as was originally the case with "Insulin." It was during my first visit to Liverpool that he decided that Crookes "Choriotope" was so successful that it should be put on the market for use by certain specified doctors and he decided to hold a course of instruction on his lead treatment. The following letter was sent out to nearly every large hospital in the British Isles. I received an invitation and to make my position more official I obtained a letter from Australia House.

Dear Dr. Swift,

It is proposed to hold Clinics here commencing at 10 a.m. on the morning of September 6th until September

15th, for the demonstration to Clinical Pathologists of the methods employed by us in the treatment of malignant disease.

It is doubtful if there will be another course held for some time, so I am writing to ask you if you would care to take the opportunity of sending a Clinical Pathologist who will act subsequently for the Clinic with which you are connected.

Certain conditions are suggested:

- (1) That the Clinic sending a Clinical Pathologist possesses all facilities for the work.
- (2) That the material "Choriotrope" be not used without proper examinations being made at frequent intervals.
- (3) That no publication be made for five years.

I shall be glad to receive the name and address immediately of your representative.

Yours sincerely,

W. BLAIR BELL.

As you see from this letter Blair Bell laid down certain conditions to which unfortunately several pathologists refused to agree and so they did not take the course. However, about forty men arrived at Liverpool from hospitals all over the British Isles. An excellent course was given including lectures, demonstrations of patients under treatment and the preparation of the lead. At the end of the course each member received a certificate entitling him to buy "Choriotrope." Unfortunately I was refused a certificate and my reply from Blair Bell was that he had "no facilities for supplying Australia." This at the time was most annoying, but perhaps was just as well as I have lately heard that the "Choriotrope" has been taken off the market as the high percentage of gelatine gave an anaphylactic reaction and several patients had died in anaphylactic shock.

On my return to Adelaide I spoke about making the lead suspension to the late Professor Rennie and he very kindly referred me to Dr. S. W. Pennycook, of the Chemical Department of the University of Adelaide. I supplied Dr. Pennycook with my notes of the preparation of S.7 and he has very kindly prepared the lead and is now experimenting with it. At the present he can only get 0.35% suspension instead of the 0.5% which is used at Liverpool. This is really a minor matter. Dr. Pennycook is also trying other methods of making this suspension isotonic without using potassium calcium salts as is done by Blair Bell. This lead which he has prepared is practically identical with that used in Liverpool, except of course as regards its percentage of lead.

Before concluding, I must say that Professor Blair Bell hid nothing from the men at the course. Questions were showered on him and we were all allowed the free run of the hospitals and laboratories. On the last day of the course we were given a lecture by Professor Blair Bell on the starting of clinics in our home towns. He advised that a small cancer hospital with a few beds be started as a contained unit with its own staff. He said that undoubtedly there was much work to be done and he considered that his successes warranted the method being tried in a much larger way than he could do in Liverpool and he also hoped that the men who

had attended the course, would communicate with him about their successes and failures. By this means he hoped that new details of technique, dosage and preparation of the lead would be found out and perhaps in the end a real cure of malignant disease be obtained.

RANDOM UROLOGICAL NOTES.¹

By GLEN H. BURNELL, M.D., B.S. (Adelaide),
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I PROPOSE to deal with a few aspects of urinary diseases as they have occurred in my practice. Those of you who see many patients suffering from urinary disorders, will hear nothing new, but I hope to bring out some points which will be of interest to the general practitioner.

Hæmaturia.

First of all with regard to hæmaturia. I think it is extremely important that every patient with hæmaturia should have a complete urological investigation during the first hæmorrhage. Patients are frequently seen with, say, a large carcinoma of the bladder who have had a recent hæmorrhage, but inquiry into their history reveals that they had another hæmorrhage months or years before, but that in that attack they were treated by medicine and rest. The patient has passed the intervening period in a false sense of security. Admittedly it is sometimes difficult to persuade a man with a painless hæmaturia that it is necessary for him to undergo a complicated examination, but the tragic results of delay bring the realization that the patient's interests demand that this examination be insisted on before the opportunity is lost.

I do not propose to discuss the causes of hæmaturia, as they are well known to you, except to remark that this is quite frequently the symptom that brings a patient with renal tuberculosis to his doctor. It is not necessarily his first symptom, as that is usually frequency of micturition, but it is often the first one of which he takes serious note. I would also remark that apart from constitutional disorders, hæmaturia may primarily be due to disease outside the urinary system.

Mrs. F., aged forty-one years, a patient of Dr. Haste, consulted me on August 27, 1925; she had passed blood four months and three weeks prior to my seeing her. A general urological examination disclosed no cause for this hæmaturia which had ceased when I saw her. She appeared again ten months later, when she said she had again passed blood several times, but this time she had a large tumour in the right lumbar region. A further investigation was not done, but the right kidney was explored and found to be normal; the tumour was felt in the peritoneal cavity. The posterior wound was closed and the abdomen opened; a greatly distended and inflamed gall bladder containing many stones was found and removed. On March 23, 1927, she reported to me that apart from a little hæmaturia soon after leaving hospital she had remained quite well.

¹ Read at a meeting of the South Australian Branch of the British Medical Association on April 23, 1927.

I think that in this case there had been a pyelitis by direct or lymphatic extension from the gall bladder, leading to the hæmaturia. We frequently see patients with urinary disease who have been subjected to radiographic examination and because of normal findings they have been allowed to go on without further investigation. I think that any condition requiring urinary investigation calls for a complete examination, including cystoscopy, ureteral catheterization and pyelography. For example, vesical calculi occasionally are not shown by an X ray examination. Too frequently the appendix is removed on account of right-sided pain which is really due to a hydronephrosis or a ureteral calculus.

Examination of the Urinary Tract.

I think that in all cases of vague abdominal pains lesion of the urinary tract should be excluded before a so-called chronically inflamed appendix is removed. Pyelography will give information that can be obtained in no other way. It will show the amount of damage that has been done to the kidneys by a renal or ureteral calculus. It will also show the exact location of a calculus whether it be in the pelvis or calyces and is also useful in distinguishing a simple pyonephrosis due to the obstruction or calculus from that due to tuberculosis. In the latter disease the calyces have a "fluffy" or "moth-eaten" appearance which is sufficient at any rate to make one suspect the presence of tuberculosis. In making a pyelogram it is advisable to give a second injection of the opaque fluid after the ureteral catheter has been drawn low down into the ureter, as, unless this is done, bifurcation of the ureter and bifid pelvis may be missed. An interesting development in pyelography is that some American workers have obtained pyelograms after giving sodium iodide by mouth. I have tried this and have succeeded in getting an outline of the renal pelvis and calyces, but while it was not a conspicuous success, it is probable that in the future it will be possible to obtain a pyelogram without resort to ureteral catheterization. I have also used "Lipiodol" for pyelography, but its viscosity makes its passage up the ureteral catheter very difficult, some pressure which is very inadvisable, being necessary. In acute renal infection I would like to emphasize the value of the in-dwelling ureteral catheter. I have previously reported rapid and complete subsidence of fulminating pyelitis after the passage of a ureteral catheter which was allowed to remain in for three days. Since then I have had the opportunity of trying this measure on a patient of Dr. L. Jeffries.

This woman during her puerperium contracted influenza with many complications. Finally she developed complete suppression of urine. Both ureters were catheterized and from then on the urinary secretion gradually returned to its normal amount.

In this case I think the catheters were left in for a week and the renal pelvis was washed out occasionally with "Neo-silvol." In chronic pyelitis something more than merely passing a catheter is usually required. In these cases several lavages of the renal pelvis with nitrate of silver solution or with one of the colloidal silver preparations will fre-

quently clear up the infection. Children especially respond in a most satisfactory manner to such treatment. This was shown very emphatically by Dr. Gordon Craig in his address to the Section of Surgery in the Medical Congress of 1924.

Mrs. R., aged thirty-seven years, was seen on November 26, 1925, for Dr. Pitcher. She complained of frequency and great pain at the end of micturition. This had been occurring "off and on" for sixteen years, coming on in attacks, but worse during the past twelve months and constant for six months. Urological examination revealed no abnormality, except for the finding of pus and Gram-negative bacilli in both ureteral catheter specimens. She was given six lavages of the renal pelvis with a 20% solution of "Neo-silvol." She reported a week ago that she still has slight frequency, but has had no pain for many months. The urine is now sterile.

Ureteral Calculus.

Ureteral calculi in my opinion call for the exercise of greater judgement than any other condition with which the urologist meets. By ureteral catheterization and pyelography it is possible to ascertain the extent of the damage done to the kidney by the stone. The amount of this damage, taken together with the facts as to whether the calculus is stationary or not, should serve as a guide in treatment. If moving and if the kidney is not seriously damaged, they are best left alone, apart perhaps from an effort to hurry their passage by the use of ureteral bougies and dilators. If caught in the ureteral orifice, they can usually be liberated by enlarging the orifice with scissors or diathermy through an operating cystoscope. The removal by open operation of stones impacted near the bladder is a very difficult procedure and in one such case I have had the mortification of seeing my patient develop a permanent urinary fistula. I think that several attempts should be made with ureteral dilators before resorting to open operation.

Tumours of the Bladder.

Practically all tumours of the bladder are malignant, either actually or potentially. With regard to the latter the treatment is fairly well standardized. It is generally conceded, I think, that diathermy offers the best prospect of success in these cases. But with regard to tumours which are definitely malignant, treatment is very unsatisfactory, as is evidenced by the fact that many diverse methods are advocated. The tendency in this State appears to be to leave carcinomata of the bladder alone. Young, of Baltimore, considers that radium and radium emanation offer the best prospects in dealing with these growths. Deep X ray therapy appears to be of little value. On the other hand Dr. Henry Wade has recently before the Urological Section of the Royal Society of Medicine advocated total removal of the bladder with transplantation of ureters. I have had an opportunity of doing a resection in one case and a partial resection in another and my impression is that this operation may be so developed that the mortality of the cystectomy *per se* will be very slight. The problem in these cases is the disposal of the ureters. They may be either (i) brought to the surface, (ii) put into the bowel or (iii) abandoned in the wound with the formation of a fistula.

A propos the second method, that is the transplantation of ureters into the bowel, I have shown you tonight two patients in whom this was done twenty months and thirteen months ago respectively and while this is undoubtedly for the patient the most comfortable method of dealing with the ureters, yet I think it also probable that the mortality from this procedure will be greater than that from simple nephrostomy or ureterostomy. One is encouraged to try the surgical removal of these tumours by the fact that metastases occur late or not at all. Howard Cecil in the *Journal of Urology*, December, 1926, states that "the autopsy records of the Johns Hopkins Hospital showed that only 50% of the patients dying of carcinoma of the bladder had demonstrable metastases," while Judd has reported a lower percentage. This being so, there appears to me to be a definite and legitimate field for this admittedly somewhat heroic procedure.

The Role of Diathermy in Genito-Urinary Diseases.

I have already mentioned the great value of diathermy in the treatment of papilloma of the bladder. In my opinion it should supersede simple excision. Other conditions in which it has proved of great value are, first, in gonococcal endocervicitis in women, secondly, in vulvovaginitis of children. Before the advent of diathermy the surgeon was at his wit's end in dealing with these patients, but their treatment can now be undertaken with a certain amount of confidence.

In the treatment of adults treatments are given to the cervix and urethra two or three times a week for fifteen to twenty minutes. In the case of children it is my practice first to dilate the hymen under anaesthesia and then later to use an electrode designed for treating the prostate in adults. It is well to remember that it is possible to burn the cervix badly in a conscious patient without causing severe pain, so all electrodes are provided with thermometers as a safeguard. A temperature of about 45.5° C. (114° F.) is maintained in the cervix, but it is not usually possible to attain this in the urethra nor in the vagina of children. Diathermy also has a definite place in the treatment of acute gonococcal prostatitis and vesiculitis. These patients are usually suffering a good deal from the strangury and frequency and a few applications of diathermy through a rectal electrode give very rapid relief. It is also of great benefit in epididymitis and arthritis complicating this disease. I do not find that by its means it is possible to dispense with prostatic massage later on, but in any case massage is not used in the acute stage.

With regard to anterior urethritis, some complicated apparatus has been produced by Siemens and Halse whereby through the use of several thermopiles it is possible to apply almost uniform heat to the urethra throughout its length. While the idea is theoretically sound, some of the men who have used it, inform me that the time of cure is little shorter than that obtained by simpler methods. My own experience of diathermy in anterior urethritis is limited and of the Siemens-Halse machine I have no personal experience.

Congenital Valvular Obstruction of the Posterior Portion of the Urethra.

While the presence of valvular obstruction of the posterior portion of the urethra has been known since 1802, when a description of an autopsy was given by Langenbeck, it was not until Young, Frontz and Baldwin in 1919 published an analysis of thirty-five cases, that this condition received the serious attention of the profession at large. Clinically the picture is that of urinary obstruction and infection dating from early childhood. It is confined to males. On examination the obstruction may be one of three types.

1. One or two valves lie just distal to the *verumontanum* and are formed by thin membranous sheets directed upward and forward and springing from a small ridge just distal to the *verumontanum*.
2. Similar valves spring from ridges proximal to the *verumontanum*.
3. An iris-shaped valve may exist quite apart from the *verumontanum*.

The aetiology of the obstruction is unsettled. Possibly Types 1 and 2 are due to an anomalous development of the Wolffian and Müllerian ducts while Type 3 may be a development from the urogenital diaphragm.

While the condition is rare, Dr. Newland has had a case in his practice and I have recently seen one. Its importance lies in the fact that if untreated, irreparable damage is done to the kidneys, while, on the other hand, if the condition is diagnosed early, its treatment is easy and gives complete relief of symptoms. The main point in diagnosis is to remember the existence of such a condition and then its detection is not difficult. Any disturbance of micturition, such as difficulty, frequency, dribbling or retention in early life, should lead to an examination of the posterior portion of the urethra. It cannot be detected by the passage of urethral bougies or catheters as these merely push the valves aside only to let them fall back into position immediately the instrument is withdrawn.

A man, aged forty-two years, gave the following history. Ever since infancy he has had difficulty in controlling urine, until the age of twelve years he had constantly wet the bed at night, since when he has constantly worn a rubber urinal. In August, 1926, he began to get pain in the left loin with symptoms of "dyspepsia," belching, constant thirst and giddiness. He had also lost a lot of weight. On examination he was found to have a considerably distended bladder reaching well above the pubes. When asked to void he had great difficulty in commencing the act and a good deal of dribbling after its completion. Immediately afterwards two hundred and forty cubic centimetres (eight ounces) of residual urine were withdrawn.

Urethroscopy revealed the presence of two valve-like structures just distal to the *verumontanum*. Cystoscopy showed a great dilatation of the bladder and also of the prostatic portion of the urethra. There were multiple vesical diverticula.

A ureterogram, which I present, shows considerable dilatation of the left ureter.

The obstruction was removed with a galvano-cautery and a week later the patient had no residual urine. One month later he reported that there was still some difficulty in controlling urine, but that his general health was considerably better than before treatment.

Unfortunately in this case treatment was so long delayed that there was very little improvement to be hoped for. If, on the other hand, these patients are seen early, a complete cure should be obtained.

I have previously mentioned the necessity of investigating the urinary tract in cases of obscure abdominal pain. Conversely, patients with symptoms typical of urinary disease may have their lesions outside that tract.

W.D., a male, aged twenty years, was seen in September, 1926. He had had periodic attacks of pain in the left loin for three months past. The pain was severe enough to double him up and radiated to the left testis. He also had pain during micturition, but worse just as he finished. A complete urological examination revealed nothing abnormal; this was also the opinion of Dr. Smeaton who him independently. Some time later this patient was found to have a tuberculous pleurisy with tubercle bacilli in his sputum.

A woman, aged twenty-seven years, was seen on July 22, 1925. Her history was that for twelve months she had had pain in the left loin. Pain almost constant, not relieved by lying down, radiated to the left groin. Frequency of micturition was present, six to eight times during the day and four to five times at night. She had had her left leg removed six years previously for some "decayed bone in the knee." Urological examination revealed no abnormality. Later she became affected by tuberculosis of the spine. In the pyelogram which I show, you will note the rotation of the lumbar vertebrae which should have made us suspect spinal disease.

Coexistence of Two Diseases.

It is well to remember that a patient with gonorrhoea may also have urinary tuberculosis. Of this I have seen two examples. I have also seen a man with tabes whose urinary disabilities were attributed to the spinal disease, but on investigation he was shown to have a large vesical calculus.

Ureteral Kinks.

With regard to kinks of the ureter, I think these are only of significance when there is evidence of dilatation of the urinary tract proximal to the kink. In this connexion I would ask you to compare these two pyelograms. They both show kinking of the ureter at the uretero-pelvic junction. In the first there is a definite hydronephrosis while in the second there is no evidence of enlargement of either pelvis or calyces. In a patient with symptoms suggestive of renal disease and in whom one finds a kinked ureter there is a great temptation to operate with a view to straightening the kink, but my experience is that unless there is definite evidence of back-pressure, such operations are foredoomed to failure.

Ureteral Strictures.

There has been and still is great discussion as to the frequency and significance of ureteral strictures. Guy Hunner maintains that such strictures are extremely common in his practice and his published case reports certainly substantiate his claim, if it is possible to judge by the results of his treatment which in these cases is restricted to simple dilatation of the ureter. His method of diagnosis is to pass a bulb-tipped ureteral catheter and then note any "hang" of the bulb during its withdrawal, just as is done with stricture of the urethra.

While there is no doubt as to the presence of strictures due to tuberculosis, new growth and pressure on the ureter from without by tumours and scar tissue (as for example after hysterectomy), I have not been able to detect the existence of any "primary" strictures of the ureter, if I may be allowed so to call them. If their diagnosis is attempted by the means of a pyelogram the surgeon must be very careful not to mistake for a stricture the normal points of narrowing of the ureter, nor yet a spasm of the circular muscle fibres.

Once diagnosed, they respond in a very satisfactory way to dilatation by means of bougies.

A woman, aged forty-three years, was sent to me on June 26, 1925, by Dr. John Verco. She had had pain in both loins with frequency and strangury for six years past. She had had a uterine suspension done and in March, 1924, had the tubes and ovaries removed. Cystoscopy revealed a normal bladder, but it was not possible to get catheters more than a few centimetres up either ureter, a pyelogram revealed early "clubbing" of the calyces of the right kidney.

In October, 1925, I dilated the right ureter and passed a Number 6 catheter into the renal pelvis. I did not see her again until December, 1926, when Dr. Verco informed me that she had had three attacks of severe pain in the lumbar region, two on the right and one on the left side. On January 5, 1927, under anaesthesia both ureters were dilated by bougies up to size 8. She reported to Dr. Verco in March, that is two months later, that she had slight pains in the loins but not nearly so severe as before and that she had lost her frequency. A later report two days ago confirms the absence of pain or frequency.

Prostatic Enlargements.

I do not propose in these random notes to touch on prostatic enlargements more than to urge on you the necessity for getting patients who are the subjects of such disorders, to submit to operation as early as possible. All too frequently the patient is advised to wait until he gets retention of urine before having the prostate removed. The smooth convalescence of a patient after operation for early prostatic enlargement, as opposed to the stormy passage of a man who has had retention, is to my mind sufficient support for the opinion that the time to remove a prostate is as soon as it is causing symptoms.

THE TREATMENT OF CHRONIC OTORRHOEA BY ZINC IONIZATION.

By G. A. D. McARTHUR, M.D., B.S. (Melbourne),
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Cases of chronic otorrhoea fall into four groups according to the type of perforation in the *membrana tympani* and the character of the discharge.

Firstly, there is the dangerous class, with a small perforation giving inadequate drainage in the postero-superior region of the drum. From this a small amount of thick fetid pus constantly oozes. In addition masses of cholesteatoma may be extruded from time to time. Granulations may be seen in the *tympanum* and carious bone may be felt on the *margo tympani*. These cases are obviously unsuitable for ionization and call for a radical

mastoid operation to prevent intracranial complications.

Secondly, there are the tubo-tympanic catarrhs, secondary to a chronic infection in the nose or throat. The perforation is in the antero-inferior portion of the drumhead. The discharge is mucoid in character, except when an exacerbation occurs in the nose, when it becomes profuse and purulent. Treatment is directed to the primary seat of infection in the nose and to the Eustachian tube itself and is effective according as to whether the infection can be eradicated in these situations. If it cannot, then ionization is useless, as reinfection of the *tympanum* occurs. The same proviso of course applies to our ordinary method of treatment.

Thirdly, there are the cases with a perforation in Shrapnel's membrane, often with hearing remarkably preserved. Ionization is not successful in these cases on account of the small size of the perforation. For the relief of this condition the operation of transmastoid atticotomy has been devised by Bondy and others.

Fourthly, there are the cases with a large open perforation, generally kidney-shaped, below the handle of the malleus or the greater part of the *membrana tensa* may be missing. These cases are quite safe, as no retention of pus occurs. The discharge is mucopurulent in character, there is no odour unless stagnation occurs in the meatus and the amount varies according to the hygienic care bestowed on the ear by the patient. A vigorous course of treatment by syringing and "drops" under the supervision of an otologist frequently effects a cure. Here the infection is obviously limited to the tympanic cavity, there being no evidence of mastoid involvement or tubal infection. Nevertheless a certain proportion of cases fail to clear up and we have either the humiliation of repeatedly telling the patient to "go on with the drops" or of submitting them to the radical mastoid operation. At operation we frequently find an antrum about the size of a bead and containing a small amount of detritus. Not much more is found in the *tympanum* and we feel that we have taken a sledge hammer to crack a nut. It is here that ionization appears to be useful in preventing these two *contretemps*.

It might be thought from the foregoing that cases suitable for ionization have been whittled down to the vanishing point, but the chronic otorrhoeas of the fourth class form a fairly large proportion of the whole.

According to Friel,⁽¹⁾ the cause of chronicity in this class of case is due to a mixed infection of the discharge. When a patient gets an attack of acute *otitis media*, his tissues are invaded by a microorganism of one species. If adequate drainage is provided, the protective mechanism of the body soon overcomes the invader and a cure results. Should the discharge become infected with various microorganisms from the meatus, then the discharge, consisting of these microorganisms and their products, serum and broken-down leucocytes, irritates the mucosa with which it is in contact and this responds by secreting pus. Thus the beginning of

chronicity occurs. Other factors, such as polyp and caries, are added later.

By establishing drainage and by syringing and drops we remove macroscopical collections of discharge, but we often fail to remove a microscopical layer which clings to the mucosa. Friel considers that zinc ions, introduced with a galvanic current, will penetrate this layer and sterilize it by causing a coagulation necrosis of its albuminous contents, including the microorganisms themselves. As soon as this occurs, the mucosa, being no longer irritated, at once stops discharging.

Friel has demonstrated by a series of test-tube experiments the coagulation of albuminous material by zinc ions and its sterilization when microorganisms have been introduced.

The technique he employs for middle ear conditions is as follows: The ear is first cleansed and then syringed with the warm zinc solution; zinc sulphate 4.5 grammes, glycerine sixty cubic centimetres (two ounces), water to two litres (seventy ounces). The patient is now lying on the sound side and the ear-piece of a Seigle's speculum is inserted into the meatus, some of the zinc solution poured in and gentle aspiration practised so as to remove any bubbles of air that may be in the *tympanum*. The positive electrode which consists of a piece of zinc wire inside a vulcanite speculum, is then placed in the ear and the negative electrode on arm or leg. The current is turned on and gradually increased to two or three milliamperes and allowed to flow for ten minutes and then gradually decreased. Surplus solution is allowed to run out of the ear, but the meatus is not dried out. Sudden changes in the strength of the current must be guarded against, as *vertigo* is then produced. When a strength of three milliamperes is reached, the patient complains of a burning sensation. Much depends on the type of rheostat used. Water resistance is the most satisfactory, as then a perfectly even graduation of the current can be obtained. When the ordinary shunt resistance is used, a certain amount of jerking is produced as the bar moves along the wire. This disturbs the patient and *vertigo* is easily produced.

Accessibility is the keynote of success in the treatment. Sterilization by zinc ions only occurs on tissue actually covered by the zinc solution. In the first place, the perforation must be large to allow the solution to enter the *tympanum*. Having entered, it must be able to penetrate to all interstices. We cannot then expect success in attic cases with a small perforation or in a mastoid antrum filled with cholesteatoma. To use ionization in such cases is a mere waste of time. Even if a large perforation exists, success does not ensue if a polypus is present. This must first be removed. Also granulation tissue must be removed and epithelial *débris* syringed out. Otherwise these form a nidus for microorganisms and reinfection of the cavity occurs. An area of carious bone also acts as a nidus and prevents a successful result. In a successful case the result is remarkable and the ear is dry in twenty-four hours. In some cases the greater part of the mucosa

dries up and we then see a small polypus or area of granulations standing out in sharp relief which was not noticeable before. Removal of these and another ionization often effects a cure. Some cases are more resistant and do not dry up till three or four treatments have been given. If an infection is not cured in four sittings, it is not likely to yield to this method at all.

Friel has published from time to time series of cases treated by ionization. He claims about 50% of cures. He has used it largely on children in the London County Council aural clinics. His results have been criticized in that he has not stated if the patients had previously received a course of ordinary treatment and for not having followed up the successful cases long enough before reporting them.

J. S. Fraser said that most otologists agreed that 50% of all cases of middle ear suppuration clear up in a reasonable time with efficient wet conservative treatment. Hence to introduce ionization as a treatment to this 50% was to employ a laborious and somewhat tedious method for patients who do not require it. Young⁽²⁾ therefore sought to determine what percentage of infections which failed to clear up with "drops" would respond to ionization. Taking a series of infections which had failed to clear up with a month's treatment, he found that 50% of these yielded to ionization, leaving 25% of the total number of patients that would need a mastoid operation. He came to the conclusion that if ionization could cure 50% of infections unaffected by syringing and drops, its place in otology was assured.

Jobson⁽³⁾ treated forty-five discharging ears and obtained twenty-nine cures, that is 60%. Eight cases were obviously unsuitable, otherwise the percentage would have been 80%. Some of the cures were dramatic. Three patients whose ears had been discharging for twenty-seven, twenty and ten years respectively, were cured in one sitting. One patient, who had displayed marvellous patience by attending hospital for three and a half years, was cured in two sittings. Other patients were cured in three and four sittings. Jobson insists on a careful preliminary toilet by syringing, suction, mopping, intratympanic irrigation and the instillation of cocaine and adrenalin, all of which help to produce the open *tympanum* desired. He came to the following conclusions: (i) That ionization will cure any case of otorrhœa that is curable by "drops," (ii) that it will do this in one hundredth part of the time taken by "drops," thus saving an enormous amount of the time of patients, doctors, nurses and hospitals, (iii) that it will cure a large number of infections which do not respond to the ordinary antiseptic treatment.

Others have not been so successful. Nora Lister,⁽⁴⁾ reporting a series of cases from the Edinburgh Clinic, obtained only 25% of cures.

The method does not appear to have become popular and it is not used in any of the hospital clinics in this city, so far as the writer is aware.

The writer has been using ionization occasionally during the last few years when suitable cases presented themselves. The cases treated have been

too few to justify any statement as to a percentage of cures that would be of any value in arriving at a conclusion as to the value of the method. As far as his experience goes, it appears to be a useful addition to our armamentarium for the treatment of otorrhœa. It is of value for patients from the country who cannot stay for a course of the ordinary treatment.

When a discharge dries up with this method, it does not mean that the cure is always permanent. Relapse may occur when the condition which produced the *otitis media* recurs, such as an acute rhinitis. Its greatest disappointment is its failure where we need it most, that is when discharge persists after a radical mastoid operation. In the experience of the writer ionization has no effect in these cases. Some unremoved or unremovable focus remains which the zinc solution is not able to penetrate.

Unfortunately the writer has had no experience with children. Friel has used it largely on children and states that they tolerate it well, even so far as falling asleep during the treatment. If this be so, it is most important.

Kerr Love in "Diseases of the Ear in School Children" describes the success of the Aural School Clinic in Glasgow where children with otorrhœa are treated at school. He maintains and rightly so that nearly all the middle ear disease of later life, both suppurative and non-suppurative, commences during the earlier years of the school period. Before the advent of the school clinic, these cases were treated, as they are here, in the out-patient departments of the public hospitals.

Kerr Love regarded their treatment at these institutions as a partial failure. The school child could not attend without the loss of at least half a day to his work at school. He could not attend often enough without ruining his school work altogether and, lastly, he could not attend alone. His mother had to come with him and so the loss did not stop at the school. It spread to the home. As a rule the treatment had to be given up or carried out by the mother. As the manipulations are difficult or at least require a good deal of knowledge and some skill, the treatment failed. As the same conditions apply in this city, the treatment fails here also.

Even at the school clinic, where daily treatment could be carried out by skilled nurses under the supervision of an otologist, it took weeks or months to effect a cure. How different the position would be if we could effect a cure in one or two sittings with ionization. If this be possible, then we should see that the necessary apparatus is installed in our public hospitals.

Case Histories.

The following are histories of some patients that the writer has treated both successfully and unsuccessfully by ionization.

CASE I.—H.B., aged thirty-seven years, had otorrhœa which commenced two days prior to being seen for the first time following a cold in the head. When first seen there was a small perforation in the centre of the posterior

segment from which mucus bubbled on self-inflation. No infective focus was discovered in the nose. Treatment to the nose, auditory tube and meatus was ineffective. Later the perforation was enlarged to obtain better drainage. Four months after the onset there was a large perforation, occupying most of the posterior segment, the mucosa of the inner tympanic wall looked thickened and granular and constantly there was a discharge of muco-pus. Two days after ionization the ear was comparatively dry and a week later was quite dry. Several months later the patient reported with a relapse. This yielded to another dose of ionization. Recently the patient reported on request. The ear has been dry since the last treatment two and a half years ago. On inspection the *tympanum* has healed. Hearing is normal for the voice, but reduced for whisper and watch.

CASE II.—N.D., aged eighteen years, received a blow on the ear eleven months ago. The ear commenced to discharge a few days later and has discharged ever since. He has been treated by drops but not by syringing. Drops keep the discharge from becoming profuse, but they do not dry up the ear completely. As soon as the drops are discontinued, the discharge becomes profuse again.

After muco-pus was removed from the meatus, a small antero-inferior perforation was seen. Much muco-pus was aspirated from the *tympanum*. The auditory tube appeared to be quite dry on catheterization. No focus was found in the nose. After ionization the ear was quite dry next day. Some months later a relapse occurred. This yielded after the ear was syringed and iodoform powder insufflated. Communication with this patient has not been maintained.

CASE III.—R.C., aged twenty-eight years, stated that the right ear had been discharging for six months. For the last four months he had been treated by an otologist, who had at last recommended operation. During the last fortnight the left ear has also been discharging.

On examination there was a large central perforation in each drumhead and a muco-purulent discharge. Ionization was carried out in both ears. The strength of the current was raised to only three-quarters of a millampère owing to a faulty cable which caused breaking in the current and discomfort to the patient. Three days later both ears were dry. The patient said that he was feeling a different man, as the noises had gone and his hearing had greatly improved. When communicated with recently, he wrote to say that both ears were quite dry and had not relapsed since the treatment twenty months ago.

CASE IV.—C.D., aged fifty-two years, stated that his left ear had been discharging since measles at four years of age. For most of his life the discharge had been intermittent, but during the last five years it had been constant. He had never had any treatment for it and had been content with keeping a piece of cotton-wool in the meatus. He sought treatment for dripping of water from his nose (cerebro-spinal rhinorrhœa) and not for his ear.

On examination nearly the whole of the *membrana tensa* was missing, except for a ring round the margin. The mucosa of the inner tympanic wall had a very thickened granular appearance. There was a moderate amount of muco-purulent discharge. Two doses of ionization of three and a half and four milliamperes reduced the amount of discharge. It was then seen that a mass of cholesteatoma was protruding from the attic. This was removed and another ionization given. The ear then dried up and there has been no recurrence of the discharge in the last three months.

This case was evidently due to a mild type of infection and would probably have responded to the ordinary method of treatment.

CASE V.—A.W. was down from the country for a few days. His left ear had been discharging off and on for two years. The cause of onset was unknown. He had had no treatment except an occasional syringing from a country doctor. The ear had been discharging very profusely for the last month. On examination the left meatus was full of pus. After syringing a large inferior perforation was seen. Half an hour later a quantity of pus had again

accumulated in the meatus. The ear was dry twenty-four hours after ionization. The patient then returned to the country and the writer has not been able to trace him.

CASE VI was a successful postoperative case. Miss L.G., aged twenty-five years, had undergone a Schwartz operation on each mastoid for acute mastoiditis, right and left. There was extreme pneumatization of each mastoid process and after all the infected cells had been opened, a huge cavity remained on each side. The cavities granulated up well, but on each side a sinus remained anteriorly, running upwards and forwards towards the *aditus* region. Six months after operation these sinuses had not healed and were discharging a muco-purulent secretion. Ionization was effected by wrapping cotton-wool soaked in zinc solution round a zinc rod and pushing it into the sinuses. As no vertigo was produced in this case, the current was run up to eight milliamperes. After six sittings on each side the discharge dried up and the sinuses promptly healed.

The following may be quoted as unsuccessful cases.

CASE VII.—G.H., aged forty-three years, stated that the left ear had been discharging for a year. For the last six months he had had continued treatment by drops and syringing.

On examination there was a large postero-superior perforation extending to the *margo tympani*. Foul-smelling pus exuded from the attic. Twenty-four hours after ionization there was just as much pus present as before. Later a radical mastoid operation was performed. Pus and cholesteatoma were found in the antrum and attic and the remains of the ossicles were carious.

CASE VIII.—Miss L.G., aged sixteen years, had had a discharging ear since she was eight months old. She had had treatment by many doctors without relief. Foul-smelling pus was in the meatus. Nearly the whole of the *membrana tensa* had been destroyed.

Two days after ionization only a little moisture was present on the inner tympanic wall and there was no foul-smelling pus. Six days after treatment there was still only a little moisture present. The patient was delighted, saying that it was the first time she could remember that the ear had not discharged. A second dose was given and next day she returned to her home in another State. Later she wrote to say that the improvement had not continued and the ear was discharging as before.

CASE IX.—Miss M.F., aged thirteen years, had had a radical mastoid operation on the left ear performed by an otologist two years ago. The ear still discharged and became painful at times. A discharging sinus was present running backwards into the mastoid area. Ionization did not affect any improvement. The mastoid was then reopened. It was found that the tip of the mastoid process had not been opened. Many infected cells were found here. When these were removed the cavity promptly healed.

CASE X.—Miss M.C., aged nineteen years, had had a radical mastoid operation performed a year ago. The ear still discharged and a red discharging area was present on the inner tympanic wall. Ionization dried up most of this area. It was then seen that granulations were present in the region of the *sinus tympani*. These were removed and another ionization was given. These areas then healed, but a small cell or area of carious bone near the junction of the inner wall and floor of the tympanic cavity still discharges slightly.

CASE XI.—Miss I.L., aged sixteen years, had a radical mastoid operation with ligation of the jugular vein in childhood. The cavity has always discharged. Three years ago an operation was performed with the object of obtaining a dry cavity. The object was not attained.

On examination there is a large radical mastoid cavity, lined with tissue which constantly discharges pus. Three ionizations have not had the slightest effect in improving the condition.

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EYE DISEASES OF DIETETIC ORIGIN: WITH NOTES ON A CASE OF OPHTHALMIA.

By S. J. CANTOR, M.B., B.S. (Melbourne),
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THE three best known diseases of the eye due to diet deficiency are nyctalopia or night blindness, xerosis or xerophthalmia, a form of chronic conjunctivitis with drying of the conjunctiva and keratomalacia or softening of the cornea, associated with the infiltration of the cornea by white cells of the blood. These diseases are important partly because they may call attention to the fact that the diet of the patient is inadequate and partly because they are generally accompanied by other manifestations of disease or by latent disease in other parts of the body.

Nyctalopia.

Nyctalopia is a disease in which vision is more or less normal by day, but is defective by night. Vision in normal persons is less acute by night, but in nyctalopia the acuity of vision sinks to a very low level and the patient may have great difficulty in recognizing small objects or in extreme cases even large objects. The condition has been compared to the retinal fatigue which causes poor vision for a short time after the eyes have been exposed to a bright light. In nyctalopia vision may be very defective also on a dull day.

There are two forms of the disease described, the idiopathic and the symptomatic. The idiopathic form is that which occurs without retinal or chorioid disease; the symptomatic form is that in which such symptoms are present.

Nyctalopia is said to occur in association with toxic amblyopia, as from cinchonism, but large doses of quinine are more commonly the cause of amaurosis, that form of blindness in which it used to be said that the patient sees little and the physician sees less. Quinine amaurosis is a condition of toxic blindness which is diurnal as well as nocturnal.

Night blindness is occasionally congenital; such cases are generally examples of the symptomatic form, being due to *retinitis pigmentosa*. Syphilitic chorioiditis or chorioido-retinitis may also produce symptomatic nyctalopia.

The idiopathic form of the disease is almost always due to an inadequate diet. It is seen associated with symptoms of scurvy; it is however due, as far as can be ascertained by experimental research in animals, to a deficiency not of the anti-

scurbutic Vitamin C, but of the fat-soluble Vitamin A. It is this idiopathic form of nyctalopia of dietetic origin that we will consider, for this main reason, that in slight form it appears to be more common than is generally believed. There is usually no observable fundus lesion in this form of nyctalopia. There may be a contracted field of vision.

In Eastern countries night blindness is frequently feigned by native police and others who wish to escape some unpleasant night duty. It is detected by placing the man in a room with his face to the wall; the room is then darkened and the man is suddenly ordered to turn and walk across the room. The malingerer is detected as he takes care to avoid injuring himself against the obstacles placed on the floor.

Nyctalopia may occur epidemically at times, in barracks, institutions and labour lines or in times of famine; cases may occur sporadically. It may be associated with the swollen gums and loose teeth of mild scurvy. It has been noted in exploring expeditions.

It is frequently advised that glasses to prevent glare should be worn (either neutral tinted or Chance's special glass will do). The patient should be protected from the light for a time and gradually accustomed to daylight. It is very necessary to attend to the diet of the patient. Fresh vegetables, especially green leaf vegetables, fresh fruit and fresh fats are required; vegetable fats are mostly deficient in Vitamin A, therefore it is advisable to use fats of animal origin. Cod liver oil is also valuable. The amount of white flour and bread should be greatly limited. The glandular organs, such as the liver, may also be taken. If the patient is taken in hand early, the night blindness can be completely cured.

Xerophthalmia.

The disease known as xerosis or xerophthalmia is also of dietetic origin, being caused likewise by a deficiency of Vitamin A. This disease may occur accompanied by night blindness or it may occur independently. It is not infrequently accompanied by signs of keratomalacia.

In animals this condition occurs within a few days if a diet deficient in Vitamin A is given. It may occur in children who receive too little protein in the diet, and less frequently it occurs in adults. There is dryness of the conjunctiva, scales of epithelium are shed and these may work into foamy patches with the movements of the eyelids. Both the ocular and the palpebral conjunctivæ are affected. Frequently there is a secondary infection resulting in conjunctivitis which may be chronic, but which may improve to recur at times later. There may be associated corneal ulceration or keratomalacia. General manifestations of diminished resistance may occur in the form of an associated diarrhœa.

In animal experiments it has been further noted that deficiency of Vitamin A results in the eyelashes falling out, usually after a period of about three weeks, the fur becomes harsh and rough. Lachrymation is deficient. There is a predisposition which is

also evident in man, to Meibomian cysts and to a granulated condition of the palpebral conjunctiva. The mucous membrane of the mouth becomes dry and similar changes are noted in the larynx and trachea. Septic infection of the parotid and other salivary glands may occur.

Experimental work has shown that xerophthalmia is not infectious; it occurs in animals and also in man, only as the result of using a diet deficient in Vitamin A. Microorganisms invade the affected tissues secondarily. In the absence of dietetic treatment, lotions and other measures fail to cure. It must be remembered that slighter cases may clear up spontaneously.

Keratomalacia.

Keratomalacia may be considered a more advanced condition of the changes which occur in xerosis. There are hyperplasia and softening of the cornea, associated in advanced cases with leucocytic infiltration. There may be hypopyon in debilitated patients. In chronic cases the corneal opacities may contain proliferating blood vessels. Other ocular changes may be evident. In advanced cases there may be invasion of the anterior or posterior chambers of the eye by fibroblasts.

The most mild chronic keratomalacial change due to deficiency of Vitamin A appears to be made manifest only by the alteration in the shape of the cornea with or without slight weakening of the sclerotic coat and of other parts of the eye. Clinically the signs and symptoms of myopia and of astigmatism or of some other error of refraction are present. In other words, visual errors are to be regarded in most cases as the result of mild chronic keratomalacia and scleromalacia, conditions which are the result of a dietary deficient in fresh animal fats or the green leaves of plants or glandular organs or fresh milk or milk products or into which preserved fats enter. Such a dietary is deficient in the antiophthalmic or growth Vitamin A. Owing to the deficiency of this and frequently of other vitamins also in the dietary as usually taken by man, other manifestations of disease may also be present. An excellent type illustrating this mixed deficiency is the "young professor" or child with large head, stunted in growth, anæmic, with the tonsillo-adenoid facies and wearing glasses.

In advanced cases of acute keratomalacia there may be definite opacity of the cornea; ulceration and perforation may occur. Other changes may result in the spontaneous evacuation of the lens into the anterior chamber or externally through the corneal ulcer. These changes may lead to panophthalmitis. Such conditions have been seen in coolies and natives fed on a ration consisting largely of rice with the addition of tinned meats or other poor foods; the dietary is deficient in Vitamin A. Similar changes may at times be seen in institution patients when the diet is not adequate. The disease may affect one eye more than the other; only one eye may be affected.

As in xerosis, there may be slightly granulated lids and occasional Meibomian cysts and the

lacrimal gland may be inactive. Deficiency of Vitamin A may cause not only the cornification, shrinking and drying of the cornea and the similar changes in the mucous membranes, but there is evidence also of slight alterations in the skin which may become dry, shrivelled and scaly. There may be *acne vulgaris*, a disease which is possibly to be regarded as primarily of dietetic origin, such factors as age and microorganisms being less important. The changes in the respiratory mucous membrane may predispose to cough and infections of the respiratory system. There may also be signs of general malnutrition and of deficient vitality.

Ophthalmia of dietetic origin, however, frequently occurs with no sign of disease in other parts of the body. The various forms of ophthalmia of dietetic origin usually respond to treatment with an enriched diet, into which foods containing Vitamin A enter, or to which cod liver oil has been added. Recent lesions are naturally more amenable than long-standing ones which nevertheless usually clear up rapidly. Treatment by drugs, locally or internally, is useless, except in what may be termed the complications of the disease, or for special reasons, such as infection, latent or manifest, by organisms such as the spirochæte of syphilis.

Ophthalmia of dietetic origin occurs in children who have been fed on a diet in which milk has been replaced largely by milled cereals, or which has been poor in fats, as in skim milk, or in which the vitamins have been largely destroyed by boiling or by preserving processes. The disease may be acute and severe or be less manifest, it may be chronic or it may be latent. In adults similar changes may occur, but more frequently the disease is mild or latent, except in debilitated patients or where the acute form occurs through the use of a diet very deficient in the antiophthalmic and other vitamins.

Chronic forms may occur with mild manifestations such as moderately frequent attacks of conjunctivitis or granulated lids or Meibomian duct disorders, yet these may terminate after several months or years in severe ocular changes and cause amaurosis or deep-seated inflammation or ulceration or other changes. The sight may be lost and the eye destroyed. One eye only may be affected. Sympathetic ophthalmia does not occur.

Edema of the eyelids may also be a manifestation of Vitamin A deficiency; it may be the earliest indication of ophthalmia of dietetic origin.

In the treatment by diet of xerophthalmia and keratomalacia it is important to remember that a diet which in most people fails to produce actual disease, but which has caused it in the patient, will not usually cure him. On the causative diet which is deficient in milk, animal fats and uncooked salads, the patient is unable to progress. The dietetic element in the ætiology of the disease may be entirely overlooked by the medical attendant and the disease may not clear up under usual methods of treatment. In some cases improvement or disappearance of lesions may occur without treatment. The seasonal factor may operate in such cases, the vitamin content of foods such as milk varying; if

the cow is chaff-fed, the milk is poorer in Vitamin A than if it is fed on green pastures. The biological quality of the dietary may vary also apart from seasonal or other influences.

It is necessary to prescribe a diet rich in the growth of antiophthalmic Vitamin A. Good cod liver oil can also be given. Milled cereals and their products, including white flour, cornflour, commercial rice and barley, as well as other poor starchy foods, should be eliminated as far as possible from the diet. Fats of vegetable origin, margarine, tinned milk and skimmed milk should not enter into the dietary which should advisedly include foodstuffs containing the other accessory food essentials, that is fresh fruit, vegetables, meat and sweetbreads such as liver should also be taken.

Notes on a Case of Ophthalmia.

Eye diseases of dietetic origin have been observed by the writer. Some of the sufferers have been beri beri patients whose dietary had been definitely deficient in several vitamins, including Vitamin A. Others have been patients in institutions suffering from nutritional deficiency. It is not always possible to prove in man that vitamin deficiency is the cause of ophthalmic disease, but the results of experimental work with animals, combined with experience in definite cases in man, make it possible for a diagnosis to be hazarded. Consideration of the menu of the patient may help. The response to dietetic treatment may serve to confirm the diagnosis. In any case a generous diet is advisable in all eye conditions. Only one case of ophthalmia will be reported hereunder.

M.McA., a female, aged twenty-three years, a clerk employed in a biscuit factory, has been suffering for two and a half years from ophthalmia of the right eye.

One sister died from tuberculosis. The father died from "meningitis" two days after the patient was born. The eye gradually became inflamed and the vision has gradually failed. The patient has been under medical treatment. A skiagram of the chest disclosed no abnormality. Tuberculin and Wassermann tests yielded no reactions. There has been no history of syphilis. Mercurial and other antisyphilitic treatment has not affected the progress of the disease. During the past eight months the right pupil has been kept dilated with atropine. The diet has been poor in Vitamin A; it has contained little fat; salads have not been taken; the patient drinks no milk. A small quantity of borated butter has apparently been insufficient to supply adequate quantities of Vitamin A. An excessive amount of milled cereal products has figured in the dietary.

The general health at present is good and the patient has lately been putting on weight; she is well nourished. The teeth and gums are good. There is chronic conjunctivitis with quasi-pannus in the right eye. There is no chorioidal disease. There appears to be some fibroblastic change in part of the vitreous. There is no hypopyon. The vision in the left eye is normal; with the right eye the patient is able to count fingers. The cornea is dry and rough. The palpebral conjunctiva is slightly granulated about the middle. The iris appears normal.

In regard to diagnosis, the condition appears to have several of the criteria of ophthalmia of dietetic origin. This diagnosis is supported by the failure to respond to treatment and by the nature of the dietary of the patient.

Treatment by a dietary rich in Vitamin A, including milk, lettuces, glandular organs and cod liver oil, has been advised. I am informed that this patient is now rapidly improving; this improvement commenced to occur within a few days of the enrichment of the diet.

Reports of Cases.

URTICARIA PIGMENTOSA IN ADULTS.

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BELONGING in the group of the rarer dermatoses, *urticaria pigmentosa* is regarded essentially as a disease of infancy; cases commencing in adult life, however, are well recognized and according to the literature are being noted with such comparative frequency of late that this type would appear to be more common than has hitherto been supposed. Because of the usual mildness or absence of associated sensory disturbance it is likely that a certain proportion of patients do not seek advice for the condition, particularly if the eruption is not involving the uncovered parts of the body.

The late M. G. Hannay in the *British Journal of Dermatology and Syphilology*, January, 1925, analysed the findings in seventy cases of *urticaria pigmentosa*, in all of which the first signs appeared at or after the age of fifteen years. He summarized his review by expressing the belief that there is no evidence to support the claim for a distinct adult type of the disease. From the clinical point of view many observers have looked upon this latter variety as presenting certain characteristic features, such as (i) the absence of the raised, yellowish, xanthoma-like plaques sometimes seen in the infant cases; (ii) the tendency to exhibit the macular lesions only; (iii) the general mildness or complete absence of itching and spontaneous urticarial signs; (iv) the small size of the pigment spots compared to those in the infant and the generally darker colour. Microscopically the point of distinction is the usual absence of mast-cell infiltration of the cutis, which is an invariable accompaniment in the true infantile cases.

The following group conforms mainly to the above characteristics and embraces five cases of the type seen in adults. The patients were seen last year between the months of March and August.

N.B., a female, aged sixteen and a half years, was seen on March 19, 1926. She was healthy and gave no history of urticaria in infancy or at any time since. The pigmented eruption commenced at the age of fifteen and involved in order the face, neck, arms and abdomen. All the lesions are macular, dark brown in colour and the largest measures approximately one centimetre across. It was owing to the development of fresh lesions on the face that the patient's mother sought advice on her behalf. Urtication may be elicited in any of the pigmented spots by gentle friction, but there is never any spontaneous wheal or irritation.

C.W., a healthy, athletic man, aged thirty years, was seen on May 12, 1926. In this case the eruption was first noticed twelve months ago and there has been a rapid, general, progressive increase in the number of the pigmented spots since they first appeared on the arms. The patient is a league footballer and his reason for attending was the fact of his club mates commenting on the condition during training operations. There is no associated irritation nor history of urticaria. The type is wholly macular and the colour more reddish-brown than in the previous case. The lesions are all very small, mostly punctate spots, but quite discrete; the distribution is fairly general, but so far neither the face, palms of hands, nor soles of the feet are involved. Urtication may be elicited by rubbing the pigmented macules in any of the areas.

D.L., a female, aged twenty-one years, was seen on June 12, 1926. She is healthy. In this case there is a history of *urticaria papulosa* in infancy, but both the patient and her mother are certain that the present pigmented eruption dates first from Easter, 1925. The distribution so far is sparse and is confined to the upper part of the chest anteriorly and the upper parts of the arms. The brown spots are noticeable when low-necked dress is worn and it is this fact which is disturbing to the patient. There

are slight sensory changes, the affected areas becoming more or less irritable when the body becomes warm. The eruption here also is of the macular type only and no lesion measures more than one centimetre across. Wheal formation occurs quickly by friction over the spots.

C.A., a male, aged twenty-seven years, was seen on June 30, 1926. He is healthy and gives no previous history of urticaria. He first noticed brownish spots on the dorsum of each foot in 1922 and a few weeks prior to their appearance he had been working more than usual in very high temperatures, his occupation being that of an engineer. The patient attributes the commencement of the eruption to this fact. The brown stains gradually increased in number and at present they are symmetrically distributed over the dorsum of each foot, the backs of the hands and more sparsely on the extensor surfaces of the lower part of each forearm. The eruption is macular and the colour more dusky than in typical cases in infants. The largest lesions are eight millimetres in diameter. There is no dermatographism, but some irritation occurs with pronounced changes of the surrounding temperature. In this patient the subcutaneous oedema produced by friction took longer to appear and then only in the lesions on the arms. Erythema alone resulted from rubbing those on the feet.

M.L., a female, aged thirty-four years, was seen on August 24, 1926. Two years ago the patient first noticed "freckles" appearing on the extensor surface of each forearm. Since that time the pigmented spots have increased to the extent that they are now to be seen fairly generally on the trunk and limbs, except that there is no involvement of the skin below the knees and the face is so far free. The colour of the lesions when I first saw her, on a cold day, was reddish-purple, almost purpuric-looking at first glance. The patient states that the macules are deep red at times and again quite brown and that the colour varies very definitely with outside changes of temperature. There is a complete absence of sensory changes and there is no urticaria or history of it at any time. Urtication in any of the lesions is readily invoked, but there is no dermatographism of the uninvolved skin. The size of the largest macule is under one centimetre and all are approximately uniform in every way.

The foregoing were all clinically typical of *urticaria pigmentosa* in the adult and no case of the disease was seen in an infant during this period, from March to August. Unfortunately no biopsy was done, as all were seen outside the hospital clinic and were not impressed with the necessity of a histological examination. The question of mast-cell infiltration was therefore not determined and this fact detracts from the value of the observations. The small series, however, would seem to show that this adult type is less rare than is generally supposed and to suggest that it tends to conform in the clinical manifestations at all events to a characteristic group of signs.

OPTIC NEURITIS AS A COMPLICATION OF WHOOPING COUGH.¹

By G. H. Hogg, M.D.,
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WHOOPING cough may, as we all know, be the cause of various eye conditions. Conjunctivitis and lachrymation occur in the prodromal stages. The violent cough may cause hæmorrhages into the eyelids or even under the conjunctivæ and cerebral hæmorrhages causing disorders of vision have been known to occur. Meningitis, an occasional complication of whooping cough, may lead to optic neuritis and even to optic atrophy, but cases of optic neuritis *per se* are of such rare occurrence that I venture to record this case.

A schoolboy, sixteen years of age, was seen on May 14, 1924, complaining of dimness of vision and of aching of the eyes and of the head. He stated that some days previously

he began to have an aching, tired feeling in the eyes and that the dimness of vision developed later.

Externally the eyes appeared to be normal. The vision in the right eye was less than $\frac{1}{60}$ and the vision in the left eye was $\frac{1}{24}$.

The field of vision of the left eye showed a scotoma for white as well as for colours in the upper and outer part. Under atropine the vision of the right eye was less than $\frac{1}{60}$, but with a convex lens of 1.50 diopter the vision was $\frac{1}{60}$. The vision of the left eye was $\frac{1}{60}$, but with a convex spherical lens of 1.25 diopter and a cylindrical lens of 0.50 diopter with a vertical axis the vision was $\frac{1}{12}$. Both optic discs were reddened, but there was no swelling.

He had been suffering from a nasal catarrh for some days and had a slight cough. The nasal sinuses were healthy, there was a decayed tooth which was extracted.

On May 20, 1924, the vision of the right eye was $\frac{1}{60}$, but with a convex spherical lens of 1.0 diopter the vision was $\frac{1}{24}$. The vision of the left eye was $\frac{1}{24}$, but with a convex spherical lens of 0.50 diopter and a cylindrical lens of 0.50 diopter with a vertical axis the vision was $\frac{1}{12}$ (two letters only being read from the test card).

The patient had developed a hard dry cough and the nasal catarrh was worse. The optic discs were much redder, the veins were somewhat distended and the margins of the discs were ill defined and woolly-looking.

On May 28 the typical whoop was present. The optic discs were slightly swollen and the margins were more blurred. The boy was sent home from school and treated by Dr. Gollan, of Ulverstone.

By the beginning of July a great improvement was noticed in his vision, the vision of both eyes being $\frac{1}{60}$. There was a slight contraction of the fields for white in both eyes, but scotomata could not be detected. On July 20 the vision in the right eye was $\frac{1}{60}$ and in the left $\frac{1}{60}$. On August 9 the vision in both eyes was $\frac{1}{60}$. The fields were normal in both eyes and the optic discs were almost normal in appearance.

Wiegmann in 1912 recorded a case in a woman of forty years who became infected while nursing her five year old son; the whooping cough lasted nearly the whole winter and after some months double optic neuritis supervened. The vision eventually improved to normal with moderate constriction of the field in the lower inner quadrant.

In Alexander's case (reported in 1888), that of a girl of twelve years of age, the whooping cough preceded the blindness by two weeks and was accompanied by intense headaches. Recovery was only partial because of the atrophy which followed.

Jacoby's case (reported in 1891) was in a girl aged six years who had developed optic neuritis after some weeks of spasmodic cough and occipital headache. Recovery was complete.

Callan in 1884 recorded a case of optic atrophy in a girl aged eleven years. She had had a severe attack of whooping cough at the age of six years which was followed by brain trouble as evidenced by severe headache, giddiness and mental symptoms. An oculist at that time pronounced that her optic nerves were swollen. For some months there was improvement in the sight, but this again failed and when Callan saw her some years afterwards, there was definite atrophy.

Gamble in 1905 described a case of a girl aged eight years who was admitted to hospital with a subconjunctival echymosis of the right eye. She had been ill for four weeks and had been whooping for two weeks. She developed a double optic neuritis with a slight exudate in the retina below the disc. Normal vision was regained.

A. Nacht (quoted by Wiegmann) describes a case of a seven year old girl who, having sickened with whooping cough six weeks before, suddenly became blind while doing her school work. Three days later a double papillitis was found with a streak-like hæmorrhage near the papilla of the right eye. The child's skull was trephined and after three days there was an improvement in vision. Five weeks later the fundus of each eye was normal. The author believed that the mechanical factors were sufficient to explain the disease picture of this case, the paroxysms of coughing causing a compression of the efferent blood vessels and lymph vessels of the head.

¹ Read at a meeting of the Tasmanian Branch of the British Medical Association on May 7, 1927.

In these six recorded cases two patients became affected by the optic neuritis two to four weeks after the appearance of whooping cough, two patients became affected after several weeks, one after some months, while in the sixth patient brain trouble supervened in the third month, to be followed later by optic neuritis.

In my case the patient's eyes became affected in the earliest stage of the disease and optic neuritis was present before the whoop was heard. There was no meningitis nor brain complication, nor could mechanical influences be advanced as possible causal factors. The neuritis was apparently due to the action of the toxin or toxins of the germ of the disease. Through the courtesy of the Librarian of the Royal Society of Medicine a search has been made of the literature of the subject and the few recorded cases have been noted.

In none of these did the optic neuritis seem to develop at so early a stage as it did in the case of this boy.

Reviews.

A BOOK FOR NURSES.

In the publication "Diseases of the Heart and Lungs: A Handbook for Nurses," Dr. A. G. I. McLaughlin, Assistant Medical Officer, Tuberculosis Department, Saint Thomas's Hospital, has realized the principle that the better education of the nursing profession by a literature of its own must enhance the utility of the nurse as an adjunct to the medical profession.¹

The presentation of the anatomy and physiology of the thoracic organs and the comprehensive survey of the symptomatology, pathology and crucial points in the treatment of associated diseases greatly enlarge the scope of recognized nursing textbooks.

The elaboration of the technique of usual and unusual thoracic operations and tabulation of instruments required will allow the nurse to combine a greater power of anticipation of the surgeon's wants with an added enthusiasm.

As an elementary work the author avoids controversial subjects, yet includes much of value to the clinician.

Some details call for comment. In regard to the part played by valvular incompetence in cardiac disease, myocardial degeneration in the absence of such lesions does not receive the prominence it merits as far as the necessity for equally considerate nursing is concerned.

In the description of the operation for pulmonary hydatid disease a warning to the nurse in regard to the necessity for rapid turning of the patient on incision of the cyst would be appropriate.

The explanation given for the benefit of sponging is that it leads to the "elimination of toxins by the skin." This is not an explanation at all. The application of cold to a large area of skin produces constriction of the cutaneous vessels. If this follows a vasodilatation and is in turn followed by a reactionary dilatation, the amount of blood passing through the skin in each unit of time is necessarily increased. Whether the benefit is the result of a thermic, chemical or mechanical result of this alteration of circulation is unknown. No advantage is gained by postulating the presence of toxins of unknown chemical composition.

The inadequacy of any attempt to classify the many grades of tuberculosis between the acute pneumonic and chronic fibroid types is referred to. The author regrets that a physical sign which would enable the physician to differentiate these forms, has not yet been discovered. Attention is rightly drawn to the fact that the severity of the immediate symptoms in tuberculosis does not depend on the extent of the lesion, but on whether caseation or fibrosis due to inflammatory response is in the

ascendant. In this connexion it may be deemed advisable to adopt measures aiming at the control of extensive lesions not associated with symptoms of distress. It is possible that the spontaneous reaction of the tissues to specific stimulation may not be maintained at a later date when favourable hygienic conditions are withdrawn. Attempts should be made when the conditions are favourable to apply prophylactic measures.

The statement that tuberculosis has usually an insidious outset fits in with common observation. The author emphasizes the value of fresh air as an adjunct to treatment. As its main value is probably derived from the accompanying solar radiation, he should have mentioned that this factor is involved in the action of treatment on hygienic principles.

ANATOMY AND ITS HISTORY.

THE history of medicine has in recent years begun to assume the place it deserves in the minds of practitioners. Much of this is due in England to the erudite efforts of Dr. Charles Singer who evidently has inspired an excellent little book, "A Short History of Anatomy," by Dr. Richard Hunter.¹ Dr. Hunter has covered the ground from the Egyptian era to the passage of the *Anatomy Act* of 1832. He lays stress on the difficulties experienced throughout history owing to the tabus forbidding interference with the human body after death which were reinforced in the Middle Ages by religious authority.

Not indeed till Vesalius laid the basis of the modern study of anatomy, did sound knowledge become general, though Mondini in 1315 and Berengario in 1521 undoubtedly dissected the human body. Leonardo da Vinci, that versatile genius, left drawings showing accurate observation of human dissection. Servetus who had described the pulmonary circulation was burned at the stake in 1553 for his heretical ideas.

The first great contribution by our own race to the knowledge of human structure lies to the credit of Harvey, 1603, while John Hunter in the latter part of the eighteenth century became our greatest comparative anatomist. The unsavoury story of the resurrectionists which led up to the present legal authorization of dissecting-room supplies affords a tragic conclusion to the long struggle towards truth and reality. It is difficult to imagine that in the early years of the nineteenth century a body for dissection had to be obtained by surreptitious means and even by force and that just a century ago the sinister pair Burke and Hare began their terrible series of murders.

Dr. Hunter's booklet is written in simple and attractive style and is worth while reading not only by students for whom it is intended, but by all medical graduates.

AUSTRALASIAN ENTOMOLOGY.

In his book, "The Insects of Australia and New Zealand," Dr. Tillyard has prepared an informative account of the entomological fauna of Australia and New Zealand in a most comprehensive manner and has presented to students of the Commonwealth and nearby Dominion a treatise that at once ranks with, if it does not surpass, that of other regions.² In the introductory chapter the scheme of classification, morphology and life history is explained lucidly and in the succeeding chapters the various orders of the insects are dealt with, likewise the geological record and origin of the Australian and New Zealand faunas to which the author has devoted so much attention. Concluding chapters cover collection, preservation and study of insects and the book is completed with an exhaustive glossary and index. Each chapter is embellished with drawings of the

¹ "A Short History of Anatomy," by Richard H. Hunter, M.D., 1925. London: John Bale, Sons and Danielsson, Limited. Crown 4to., pp. 51. Price: 2s. net.

² "The Insects of Australia and New Zealand," by R. J. Tillyard, M.A., Sc.D. (Cantab.), D.Sc. (Sydney), F.R.S., F.N.Z. Inst., F.L.S., F.G.S., F.E.S., C.M.Z.S.; 1926. Australia: Angus and Robertson, Limited. Royal 8vo., pp. 576, with illustrations. Price: 42s. net.

¹ "Diseases of the Heart and Lungs: A Handbook for Nurses," by A. G. I. McLaughlin, M.B., Ch.M. (Sydney); 1926. London: Faber and Gwyer, Limited. Crown 8vo., pp. 185, with illustrations. Price: 4s. 6d. net.

utmost clarity. The illustrations, which in the main are the joint work of the author and his talented wife, are notable for their beauty and accuracy, particularly the coloured plates. These latter could have been improved in printing, for it seems a waste of effort to delineate a subject carefully in colour and to have its reproduction marred by poor registration. Generous acknowledgment is made in the preface to specialists and authorities for assistance rendered in varying degrees, a courtesy by no means as universal as it might be.

To every student, whether he be tiro or advanced research worker, this book must prove of value. The high standard set by the author in his "Biology of Dragonflies" has been more than maintained and the publication reflects great credit to all associated with it, author, artist and publishers alike.

MALAYAN CULICIDÆ.

THE Institute for Medical Research at Kuala Lumpur in the publication of the present number of its studies makes a further valuable contribution to the knowledge of tropical hygiene and public health.¹ Number 18 of the studies, being "Notes on the Treatment of Malaria with the Alkaloids of Cinchona," appeared in 1923 and Number 19 on "Dysentery in the Federated Malay States," in 1924. The Institute also issues bulletins, of which Number 2, of 1926, on "Tropical Typhus and Brill's Disease," is of particular interest to Australians on account of the typhus-like disease in Australia which was first recognized by Dr. F. S. Hone.

Dr. Stanton's "Notes on Malayan Culicidæ," now collected together, were originally published in a series of separate papers. The collection includes a description of the changes which occur in certain characters of *Anopheles* larvæ in the course of their growth; an account of the *Anopheles* of Malaya; notes on Sumatran Culicidæ and on the larvæ of Malayan *Anopheles*; records of malaria infection in Malayan *Anopheles* and a section on the mosquitoes of far eastern ports dealing *inter alia* with the prevalence of *Stegomyia fasciata*. The latter is of more particular interest to Australians as this mosquito is prevalent at times along the east coast from Newcastle northwards, and as the transmitting agent of yellow fever it always presents the possibility of mosquitoes, infected with the *Leptospira* of that disease, reaching Australia. Dr. Stanton thinks that the danger of the introduction of infected *Stegomyia fasciata* by incoming ships has been exaggerated. The systematic observation of a number of ships within the tropical belt, coming from ports heavily infested with this mosquito, failed to disclose their presence. The technical descriptions of the larvæ *et cetera* and of various mosquitoes are accompanied by excellent sketches illustrating the main points of importance.

We should like to congratulate the Institute on the work that is being done there and on the publications that it is producing.

Analytical Department.

KELLOGG'S "CORN FLAKES."

KELLOGG (AUSTRALIA) PROPRIETARY, LIMITED, are the manufacturers of "Corn Flakes," a well-known starchy food. This preparation is manufactured in Sydney, while the same firm prepare two other foods, "All Bran" and "Pep" in their factory in America. In order to be in a position to guide the medical profession in regard to these products, THE MEDICAL JOURNAL OF AUSTRALIA has had an investigation carried out at the Sydney factory and the process of manufacture of the American preparations has been studied

by means of a cinematographic film. A large number of chemical analyses has been carried out in connexion with this inquiry.

The Factory.

The factory of Kellogg (Australia) Proprietary, Limited, is a modern brick building, substantially constructed in concrete. It is a large building of several floors, erected to carry heavy machinery. The lighting is from the front and rear of the building and is sufficient to permit of natural illumination of the whole establishment during the greater part of the day. A judicious arrangement of the machines prevents interference with the main avenues of light from both sets of windows. The ventilation has been planned to remove the heat and moisture generated from the machines in large amounts. It is satisfactory. This is a most admirable feature of the factory. Although large quantities of hot, moist product are passed from one machine to another with the escape of much steam and the spread of moisture, the walls and ceilings of the several rooms are dry and clean, proving that efficient air currents are provided to remove the water vapour.

The factory was clean on the three occasions when our inspector visited it. Such a factory can be kept clean only by repeated and constant cleansing. The nature of the product manufactured necessitates a thorough system of cleaning, if a pure, wholesome food is to be offered for sale. Maize grains continually escape from machines, often in a moist state. Moulds form in a few hours on the moist grains. No mouldy or discoloured grains were seen by our inspector around any of the machines or in any part of the factory. The machines are kept in a high degree of cleanliness. Every machine has been examined and found to be perfectly clean. Moreover, the machines are kept in a high state of efficiency, which indicates that much care is expended in controlling them and that the system is a good one. The absence of dirt in angles, corners and crevices in the neighbourhood of the machines from which wet grits are removed, is good evidence of the use of proper methods of cleaning. The machines appear to be admirably suited to the purposes for which they are employed. Adequate guards are provided to prevent accidents.

"Corn Flakes."

"Corn Flakes" are made from maize. The endosperm of the maize is separated from the hull and from the germ. It is cooked and a flavouring agent is added. It is then flattened by rolling and is finally toasted.

The grains of corn are passed through sieves and cleaning machines which separate the cleaned grains of maize from dust and foreign matter. The grains are then steamed to soften them, so that the outer covering or hull can be removed. After this has been done, the germ is separated from the endosperm. The removal of the germ is the most important step in the process of manufacture. The natural oil of the embryo is liable to oxidation. It becomes rancid in consequence and the cereal products are then useless. To prevent this the source of the oil is removed. Degermination is effected by an appliance designed to cause separation of the endosperm. The separated endosperms are spoken of as grits.

The clean white grits are cooked under steam pressure in closed retorts after the flavouring liquid has been added. The flavour contributes largely to the attractiveness of the finished preparation. The flavouring agent is prepared under proper hygienic conditions. The grits change in colour during the process. After the grits have been cooked, they are transformed into flakes by passing between steel rollers which exert a pressure of about forty tons to the square inch. The flakes are conveyed to the toasting ovens through which they pass in a measured time. During this part of the process continuous inspection is necessary to obtain a product even in colour and in size. This is accomplished partly by human inspection and partly by the intervention of automatically acting machinery. Every effort is made to avoid unnecessary direct handling of the product and to insure sterilization whenever the grains have been touched by hand. Finally the grains are cooled before they are passed to the packing staff.

¹ "Studies From the Institute of Medical Research Kuala Lumpur, Federated Malay States: Number 20; Notes on Malayan Culicidæ," by A. T. Stanton, M.D., F.R.C.P., D.P.H.; 1926. John Bale, Sons and Danielsson, Limited. Crown 4to., pp. 94.

The packing is carried out with the aid of suitable machinery. Handling is reduced to a minimum. "Corn Flakes" are placed in cartons fitted with an inner waxed paper bag. After the filling of the package, the waxed paper is folded and sealed by heat. Each carton is enclosed in a waxed paper covering.

Analyses.

Analyses have been carried out of "Corn Flakes" made at the factory. The samples collected were compared with samples purchased in the open market.

Three samples collected at the factory yielded 6.14%, 6.14% and 6.17% of moisture and 2.06%, 2.07% and 2.08% of ash. The estimations of the protein content gave the following figures: 8.4%, 8.4% and 8.6%; the estimations of the fat content gave 0.5%, 0.55% and 0.6%; the fibre amounted to 0.3%, 0.31% and 0.32%; the reducing sugar amounted to 2.0%, 2.2% and 2.2% and the polysaccharides 80.1%, 79.7% and 79.8%. The results are summarized in the following table:

TABLE I.—RESULTS OF ANALYSIS OF "CORN FLAKES" IN PARTS PER HUNDRED.

Sample.	Water.	Ash.	Protein.	Fats.	Fibre.	Sugar.	Starch and Dextrin.
A	6.14	2.06	8.4	0.5	0.3	2.0	80.1
B	6.14	2.07	8.4	0.55	0.31	2.2	79.7
C	6.17	2.08	8.6	0.6	0.32	2.2	79.8

In Table II the water content and protein content of the samples purchased in the open market are given. The figures are parts per hundred parts.

TABLE II.—PROTEIN AND WATER CONTENT OF PURCHASED SAMPLES OF "CORN FLAKES" IN PARTS PER HUNDRED.

Sample.	Water.	Protein.
Sydney 1	6.8	8.8
2	6.8	8.2
3	6.2	8.3
4	6.1	8.4
5	6.2	8.4
6	5.9	8.7
Blackheath 1	5.8	8.5
2	6.2	8.4
Moruya 1	6.4	8.3
Nowra 1	6.3	8.3

The results of these estimations reveal that the process of manufacture yields a product of approximately constant food value. The food value is about 3,800 calories per kilogram (1,725 calories per pound).

"All Bran."

"All Bran" is manufactured by Kellogg Proprietary, Limited, at their main factory at Battle Creek, Michigan, United States of America. The process of manufacture has been illustrated by means of a cinematographic film which was exhibited to our inspector.

The main factory and some separate buildings and silos have been laid out in such a manner that the risk of destruction by fire has been reduced to a minimum. The design admits of expansion in many directions. There are over twenty acres of floor space available in the several parts of the factory. The buildings are equipped as a model factory for the preparation of cereal foods. There are laboratories where the materials employed are examined and where the intermediate and finished products are controlled. The conditions of work are exceptionally good. Large, airy rooms are provided as rest rooms for the workers, while the dining rooms and rooms for recreation leave nothing to be desired. The social hall is said to possess the largest and most elaborate auditorium between New York and Chicago. An orchestra is engaged to

perform at meal times and for entertainments. There are sports grounds in the immediate neighbourhood. There is a medical department with a practitioner and nurse in constant attendance. It is stated that the firm erected and equipped the factory on the best modern lines after the old factory had been destroyed by fire in 1907.

"All Bran" is stated to be prepared from bran by cooking in a rotary cooker together with the flavouring agent by means of steam pressure. The bran passes in a rotary drier from which it is drawn into the shredding machinery. The shredders are composed of two grooved rollers which press together and unite the flakes of bran into long shreds. The long shreds are conveyed on belts to toasters consisting of ovens in which the shreds are carried backwards and forwards until the toasting is completed. This process takes about thirty minutes. The toasted bran is cooled and packed by automatic machinery in cartons lined with waxed paper.

Analyses.

Samples of "All Bran" were subjected to analysis. The results are given in Table III.

TABLE III.—RESULTS OF ANALYSIS OF "ALL BRAN" IN PARTS PER HUNDRED.

Sample.	Water.	Ash.	Protein.	Fats.	Fibre.	Sugar.	Starch and Dextrin.
"All Bran" 1	2.3	6.4	14.4	2.5	7.7	2.2	63.5
2	2.2	6.4	14.3	2.5	8.2	2.4	62.8

The food value is about 3,692 calories per kilogram (1,675 calories per pound).

"Pep."

"Pep" is stated to be manufactured from soft winter wheat. The whole wheat grain is mixed with wheat bran in the process. Wheat grains are cleaned and sifted to remove seeds, foreign bodies and dust. They are washed and dried in a current of hot air. After being flattened by rollers, they are mixed with bran and a flavouring agent is added. The mixture is cooked in rotary cookers under high pressure steam. The material is then dried and passed through rollers at high pressure. The product is finally toasted, cooled and packed.

Analyses.

Samples were subjected to analysis with the following result:

TABLE IV.—RESULTS OF ANALYSIS OF "PEP" IN PARTS PER HUNDRED.

Sample.	Water.	Ash.	Protein.	Fats.	Fibre.	Sugar.	Starch and Dextrin.
"Pep" 1	6.1	1.80	10.8	1.6	4.0	2.4	72.6
2	6.2	1.79	10.7	1.8	4.2	2.0	73.2

The food value of "Pep" is approximately 3,747 calories per kilogram (1,700 calories per pound).

Conclusions.

All the samples analysed were found to be clean and of uniform appearance. The packages were in every instance closed and sound. The products appear to keep well. Samples kept in the laboratory for four months have undergone no change in appearance or flavour.

It can be stated that "Corn Flakes," "All Bran" and "Pep" are carefully prepared foods consisting of starches, dextrins and proteins. They are flavoured with sugar and caramels. Their nutrient values are considerable and when used with reason they are all reliable, excellent preparations.

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SATURDAY, JUNE 4, 1927.

National Insurance.

THE reports of the Royal Commission on national insurance are important documents to which the medical profession must direct its attention. The first progress report was issued early in 1925 and was reproduced *in extenso* in this journal. The main matters dealt with by the Royal Commissioners were discussed in April and May of that year. The second progress report dealing with unemployment is dated July 30, 1926, while the third progress report on destitute allowances is dated December 15, 1926. Although both these reports are of interest, the problems with which they are concerned, have but little direct bearing on medicine; we have, therefore, not reproduced the second and third progress reports in full, but have printed the recommendations. The final report is entitled "Membership, Finance and Administration." The arguments as well as the recommendations are significant and should be studied closely.

It does not follow that the recommendations of a Royal commission are endorsed by governments or by members of Parliament. Nor does fresh legislation necessarily follow the issue of a report of a Royal commission. The reference of the Royal Commission on National Insurance was to inquire into national insurance as a means of making provision for casual sickness, permanent invalidity, old age and unemployment, the operation of the maternity allowance system and the payment of destitute allowances. It will be noted that this reference does not embrace the question of medical benefit under a system of national health insurance. As was pointed out two years ago in these columns the Royal Commissioners have extended their inquiry somewhat outside their reference. They have dealt with such subjects as prevention of disease, maternal hygiene, industrial hygiene and medical research. It is difficult to reconcile the inclusion of these subjects with the restricted objects of the inquiry, but it is equally difficult to understand

how a practical scheme of national health insurance could be devised without medical benefit and some provision for preventive medicine and research.

The attention of the medical profession is directed in the first place to the arguments and recommendations of the Royal Commissioners in regard to persons to whom the provisions of the insurance fund should apply. It is stated that if a wage limit were imposed, any future alteration in the standard of wages would have an important influence on the "eligible membership of the scheme" and a consequent effect on its financial basis. It has been discovered that 5.6% of all wage and salary earners in the Commonwealth are in receipt of £300 a year or more and that 1.4% receive £500 or more. Expressed in this way, it would almost seem as if the conclusion were justified that a wage limit is unnecessary. Australia has approximately six million people. Of these, according to the statistics published in the second progress report 1,648,000 are employees. If this number corresponds with wage and salary earners, the number of persons with incomes of five hundred pounds a year or more would be 26,368. It will further be noticed that "the main objection raised by the friendly societies to the model agreement relating to medical attendance is in regard to the income limit." The medical profession has already given its reply to this argument. It will refuse to entertain any insurance scheme which includes the granting of medical benefit unless there is a fixed income limit. Moreover, the friendly societies in their negotiations with the medical profession have admitted the justice of the maintenance of a ratio between the rate for medical attendance and the income limit.

The second point to which we wish to draw attention, is that concerning the contributions to the fund. The Royal Commissioners state boldly that the aim of national insurance is to assist the wage-earner to provide for future emergencies and to encourage thrift. They maintain that the employer's contribution is regarded as the price which industry pays for its share in the diminution of the worker's earning capacity. Again they find that wage earners have the greatest difficulty in maintaining unaided a system of insurance which requires regular contributions over long periods.

These arguments are sound in so far as they apply to wage-earners receiving the basic wage or a little more. The man earning ten pounds a week has little difficulty in making provision for future emergencies; he does not find it impossible to maintain his contributions indefinitely. Unless he is spendthrift and reckless, he is able to save for his rainy day. Is there any justification in requiring the employer to add to this high wage a further sum to provide for the expenses of illness? Instead of stimulating thrift, it would tend to make the well-paid employee extravagant and improvident. The Royal Commissioners suggest that the insured person should not be required to pay any contributions while he is unemployed or in receipt of benefit. The skilled artisan with a high wage or the salary earner would thus not be required to continue to pay premiums for his insurance if he takes a holiday in the interval between leaving one employment and entering another. He would also be relieved of the necessity of paying while he is in receipt of benefits. The proposals are commendable if applied to persons receiving small wages.

The suggestions in regard to the administration of the insurance fund are highly unsatisfactory. The central administrative body is to include representatives of the three contributing parties, the Commonwealth, the employers and the insured persons. The latter are all wage and salary earners over the age of sixteen years. It must be remembered that it has been proposed that medical benefit should be conducted by the Commonwealth Health Department. Unless some system is devised whereby the insured person will be enabled to secure medical attendance in the ordinary way as a private patient of a private practitioner, the position of the medical profession under a system administered by this central body would be unenviable. The Royal Commissioners further suggest the formation of local advisory committees on which interested organizations including friendly societies would be represented. To allow the friendly societies to intervene between the medical profession and over twenty-six thousand affluent persons cannot be regarded as a practical suggestion. The Federal Committee has set out in its scheme (see THE MEDICAL JOURNAL OF

AUSTRALIA, February 28, 1925, page 220), the conditions under which the medical profession would be prepared to take part in a national health insurance. The Royal Commission has deliberately refrained from including medical benefit in its system, but it would be unsafe and foolish if the medical profession were to ignore the recommendations on that account. The proposed system is unacceptable from every point of view. The Government must realize that in no circumstances would the medical profession give medical attendance under any insurance scheme that embraces all wage and salary earners and places the control of the benefits in the hands of a body consisting of representatives of so-called interested organizations.

Current Comment.

EXPERIMENTAL EPIDEMIOLOGY OF TUBERCULOSIS.

IN the issue of July 17, 1926, reference was made in these columns to work by Topley and Greenwood and by Flexner on experimental epidemiology. These observers broke new ground and disclosed facts of primary importance, but at the same time the explanations given by them of the findings did not always agree. The diseases investigated were mouse typhoid and mouse pasteurellosis. This work has been followed by some experimental work undertaken by David Perla on artificially induced epidemics in guinea pigs.¹ Spontaneous tuberculosis was observed in guinea pigs and rabbits which either had been injected with some innocuous material in the course of other experiments or had been caged merely in the same room with tuberculous animals. In view of this he has endeavoured to determine under experimentally controlled conditions the frequency of the occurrence of spontaneous tuberculosis and the factors in its spread. It must be remembered that the guinea pig is extraordinarily susceptible to tuberculosis. It has been aptly named "a test tube for tuberculosis." Koch found that rabbits and guinea pigs not infrequently manifested spontaneous tuberculosis when exposed in the same room with tuberculous animals for a longer period than four months. Koch held that if rabbits or guinea pigs have remained for three or more months in the same room with tuberculous animals, no reliance can be placed on experiments in which the animals are used, unless spontaneous tuberculosis can be excluded. While these considerations are of importance for observations on epidemiology, it is seldom that they need be taken into account in routine laboratory work. Animals are seldom kept in one room for so long a period as three months and healthy animals may be kept in cages adjoin-

¹ The Journal of Experimental Medicine, February 1, 1927.

ing those of tuberculous animals without contracting the disease. Tuberculosis among laboratory animals does not occur in epidemics like pseudo-tuberculosis.

In regard to the occurrence of spontaneous tuberculosis among rabbits and guinea pigs Perla points out that infection may be acquired naturally or by wound infection. He describes three instances in which wound infection occurred. The diagnosis was made on the basis of the pathological findings at autopsy and the presence of acid-fast bacilli in smears made from involved organs. To test the incidence of spontaneous tuberculosis in the general animal room four cages each containing four animals were used. One cage was placed among rabbits treated with horse serum in the course of other experiments, two among cages containing guinea pigs injected with suspected tuberculous material and the fourth cage was placed among tuberculous rabbits. In two animals among the last mentioned group spontaneous tuberculosis occurred. One was killed one hundred and thirty-two days after exposure and the other died two hundred and seventy-eight days after exposure. The length of time exposure in the case of the other fourteen animals is not stated. Acid-fast bacilli were found in smears taken from a lung cavity of one animal and the diagnosis in the case of the second animal was made solely from the macroscopical appearances—the presence of tubercles in the lungs, caseous areas in the spleen and so forth. Perla concludes that bronchiogenic infection is possible among guinea pigs exposed to tuberculous animals, although isolated in separate cages.

Experiments in regard to spontaneous tuberculosis were then undertaken. Observations were planned to determine the effect of varying degrees of exposure, the effect of crowding on the incidence of spontaneous tuberculosis and the pathogenesis and pathology of spontaneous tuberculosis acquired by direct exposure to tuberculous animals with "closed" and "open" lesions. Guinea pigs to the number of four hundred and sixty were kept under close observation. When any doubt was present about the diagnosis sections were made and animal inoculations were used. In every case of spontaneous tuberculosis the diagnosis was confirmed by the preparation and staining of smears for acid-fast bacilli. Several experiments were carried out in regard to the intensity of exposure. In one experiment sixty guinea pigs of the same weight and age were divided into five series of twelve and were placed in five large cages arranged in a vertical series. The top cage held twelve normal control animals, the second three infected and nine normal animals, the third six infected and six normal, the fourth nine infected and three normal and the bottom cage twelve normal animals. All infected animals had received intraperitoneal injections and no "open" lesions occurred. All animals were killed after seven and a half months. In the control cages no spontaneous infection occurred. In Cage 2 one example was found and in Cage 4 two examples. In Cage 3 no spontaneous tuberculosis occurred, but only three of the normal animals survived through-

out the entire period. The portal of entry was in all cases the intestinal tract and the mesenteric glands. The source of infection was probably faecal contamination of food. In another experiment five small cages were arranged in a similar fashion to that of the last experiment and thirty animals (normal and infected) were similarly arranged. Three instances of spontaneous infection occurred. One point of interest and of possible importance should be noted. Throughout these two experiments when animals died, fresh animals (either normal or infected) were introduced so that the proportion of normal to infected animals remained constant. Topley and Greenwood in their experiments on mouse typhoid found that when an epidemic had been established, the further course of events depended on the rate of introduction of susceptible hosts. Flexner also found that when new mice were added, the older mice became affected and died. He ascribed this to the dosage of bacilli. Topley considered that fluctuation in the virulence of the bacilli was responsible. Dudley's views on the occurrence of an epidemic of immunity being concurrent with an epidemic of infection may also be considered. Of course the nature of the infection in Topley's and Flexner's experiments was entirely different. Mouse typhoid is acute and lethal. Infection of guinea pigs by tuberculosis, on the other hand, is a much slower process. It is difficult to assess the influence of the importation of new individuals in Perla's experiments on account of the smallness of the numbers in any one cage, but it is quite possible that the death of one animal and the substitution of another would have some varying effect.

Another experiment was carried out in an attempt to determine the effect of crowding. Eighty-four animals were used, twenty of whom were infected. The incidence of spontaneous tuberculosis was greater than the incidence in any other series, but since Perla can draw no conclusions from the results, they need not be considered in detail.

In considering Perla's work it is important to remember that a guinea pig injected with tubercle bacilli will contract the disease at once in an acute form and will die. On the other hand if a young guinea pig is given a small dose of tubercle bacilli in an attenuated form, it may recover and if it is given a full virulent dose after recovery, a chronic form of tuberculosis characterized by cavity formation of the lung results. In all Perla's animals caseation was found and in two of them cavities were present. This means that the spontaneous tuberculosis produced by Perla was of a chronic type presumably associated with a previous sensitization of the animal. From the epidemiological point of view this is important and the application to human tuberculosis is obvious.

Perla's work is evidently intended to serve as an introduction to further investigations. He does little more than state his main conclusion in regard to the occurrence of spontaneous tuberculosis and the increase of its incidence with the intensity and the duration of exposure and the nature of the resulting infection. His further contributions will be awaited with interest.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Release of Vasodilator Substances in Injuries of the Skin.

T. LEWIS and his collaborators have during the past few years been bringing forward evidence that minor skin injuries, such as light scratches, wheals *et cetera*, are associated with the liberation in the skin of minute amounts of histamine or a body having a histamine like action. T. Lewis and I. M. Harmer (*Journal of Physiology*, December, 1926) have attempted to demonstrate the presence of this substance by physiological tests. They selected subjects in whom the skin reacts vigorously to stroking, each stroke though painless, producing a conspicuous local vasodilatation and whealing. It has previously been shown that skin of this nature is unusual only in the degree to which it reacts, for similar reactions may be obtained from any skin by suitably grading or repeating the stimulus. A comparatively large area of the trunk was stroked by means of a coarsely and bluntly toothed comb, the desire being to obtain a large number of closely set wheals almost simultaneously. It was found that a slight but distinct vasodilatation occurred. This was most readily detected in the face which flushed perceptibly and displayed a rise of temperature of about 0.6° C. The flush was not so visible in the arm and hand, though here also the temperature rose by almost equivalent amounts. A fall of blood may be discerned, but usually the reaction was insufficient to cause this change. When histamine in doses of 0.3 cubic centimetre of a one in three thousand solution was introduced subcutaneously in these subjects precisely similar general reactions resulted and lasted for the same length of time.

Vasodilators from Tissues.

It has long been known that simple watery extracts of various organs of the body produce a pronounced depressor action when injected intravenously especially in the *carnivora*. It was recognized that histamine produced the vascular and other characteristic effects of the hypothetical vasodilator and it was suggested that histamine was the active substance in these tissue extracts. Barger and Dale succeeded in isolating from an extract of intestinal mucous membrane sufficient of this base for chemical as well as physiological identification. The quantity obtained was small in relation to the total activity of this kind exhibited by the extract and the nature of the raw material left it doubtful whence the histamine came. Subsequent work seemed to weaken the claim that the active substance was histamine, for extracts were found to be stable under conditions in which histamine is destroyed in pure

solution and *vice versa*. C. H. Best, H. H. Dale, H. W. Dudley and W. V. Thorpe (*Journal of Physiology*, March, 1927) have studied from this point of view extracts of the liver and lung. Histamine and choline have been isolated from alcoholic extracts of fresh liver and lung in quantities sufficient to account for the immediate vasodilator activities of these extracts. Histamine is responsible for the greater part of this activity and is present in remarkably large amount in extract of the lung. There is good reason to believe that the histamine is present as such at least as soon as the cells are killed by contact with alcohol. The lungs were removed from the living anesthetized animal and at once dropped into alcohol cooled with solid carbon dioxide and thus frozen immediately. It was then minced while frozen and returned to cold alcohol so that minimum change must have taken place in the tissue. Histamine being present as such in the living cell or released therefrom at the moment of death, questions of great interest arise as to the manner in which it is held by the protoplasm during life and prevented from producing its intense physiological action. The presence of so much histamine in a tissue as can be extracted from the lung, can hardly be without physiological significance. One hundred grammes of lung tissue may be expected to contain as much as seven or eight milligrammes of the base, a quantity which, if suddenly released into the circulation of the animal, would produce a profound, shock-like action.

Energy Output of the Heart.

SOME years ago Starling showed that in an isolated heart beating at a constant rhythm and well supplied with blood, the larger the diastolic volume of the heart (within physiological limits) the greater is the energy of its contraction. It was not known whether the increased energy of contraction was attended by and due to increased chemical change. The amount of the latter should be a function of the initial length of fibre, as has been shown to be the case for voluntary muscle. E. H. Starling and M. B. Visscher (*Journal of Physiology*, January, 1927) have attempted to answer this by noting the oxygen consumption of the heart under different conditions. They find that under the conditions they have studied the oxygen consumption of the isolated heart maintained under constant chemical and temperature conditions, is determined by its diastolic volume and therefore by the initial length of its muscular fibres. This rule applies whatever the physiological condition of the heart. During the whole of an experiment the oxygen consumption at a given diastolic volume is always the same, whatever the work that the heart is performing at this volume. In a heart functioning well every increase or decrease in work done by the heart is accompanied by a proportional

increase or decrease in diastolic volume. The diastolic volume is constant for any given amount of work, whatever the inflow and the arterial resistance. It follows that any increase in the work demanded of the heart is met by a corresponding increase in the oxygen consumption of this organ, consequent on the increased initial length of its muscle fibres. As the heart tires and its functional capacity decreases, its mechanical efficiency is diminished. That is, although the total energy liberated at any given initial length of fibre remains unchanged, the fraction of this energy which can be utilized for the performance of work, progressively diminishes. To do the same amount of work the heart has therefore to dilate continuously and the work is maintained constant at an ever increasing cost in total energy. At the same diastolic length of fibre a heart uses more oxygen per beat when contracting at a low than at a high rate. Slowing the heart enables it to do more economically a given amount of work per unit of time.

The Aqueous Humour.

W. S. DUKE-ELDER (*Journal of Physiology*, March, 1927) has studied the osmotic pressure relations between the aqueous humour and the arterial and venous blood with a view to determining the method of production of the aqueous humour. Evidence is brought forward which suggests that the aqueous humour is a dialysate of capillary blood, in that when this fluid is equilibrated with arterial blood, its refraction, conductivity and sugar content remain practically unaltered, any change which does occur, being in the direction of equilibrium with venous blood. The osmotic pressure of the aqueous is the same as that of a dialysate. It is therefore less than that of the blood, the amount depending on the difference in colloid content of the two fluids. It is shown further that the ionic relations of the aqueous and the blood are such as would be expected from consideration of the Donnan membrane equilibrium.

Secretion of Thyreoglobulin.

C. S. HICKS (*Journal of Physiology*, December, 1926) has studied the innervation and the control of secretory activity of the thyroid gland by the application of a precipitin test for thyreoglobulin to the examination of the blood and lymph from the thyroid in the intact animal. This was done on the assumption that thyroxin would be secreted into the blood or lymph, combined with the globulin. Thyreoglobulin was prepared from fresh thyroids of dogs and used to produce a precipitin serum from rabbits. Serum precipitins, arising from serum contamination in the antigen, were removed by treatment with dog serum. It was found that thyreoid lymph and venous blood contained a substance which reacted with the antiserum against dog thyreoglobulin, while this substance was absent from arterial blood or too

dilute to react. The thyroglobulin apparently passes from the thyroid gland to both lymphatics and veins, chiefly the latter. Electrical stimulation of the sympathetic nerve supply to the thyroid produced no change in thyroid secretion rate, as measured by the output of thyroglobulin determined by the quantitative reaction of the latter. Administration of iodine appeared to increase the flow of lymph from the apical lymphatics of the thyroid gland, as well as to increase the content of thyroglobulin therein.

BIOLOGICAL CHEMISTRY.

Lactic Acid Formation.

C. LOVATT EVANS (*Biochemical Journal*, May, 1926) has made a study of the effect of caffeine on the formation of lactic acid in the plain muscle of the tortoise. It would seem from the results of several investigators that the effect of caffeine in producing rigor in skeletal muscles is accompanied by an acceleration of the breakdown of glycogen and of lactacidogen into lactic acid due to unloosing a chain of processes similar to those which follow the stimulation of the muscles. Experiments made on strips of plain muscle from the stomach of the tortoise show clearly that the formation of lactic acid in plain muscle under anaerobic or practically anaerobic conditions is definitely slowed. Observations on muscle, kept in nitrogen for some hours before removal to oxygen, show that the processes of oxidative recovery in plain muscle are unaltered by caffeine. It would also appear that caffeine exerts a decidedly inhibitory effect on the acceleration of formation of lactic acid in plain muscle induced by arsenates. The difference in the action of caffeine on plain and on striated muscle is of some interest especially in view of the identical action of arsenates on the two kinds of muscle. If it be assumed that arsenates are concerned in accelerating the breakdown of hexosephosphate in plain muscle as they do in yeast fermentation of glucose and in the excitatory processes of striped muscle, the different effect of caffeine on the two varieties of muscle would be in accord with the view that caffeine acts upon a different link of the chain of reactions in muscle than arsenates. Some considerations lend support to the belief that caffeine retards the liberation of the lactic acid precursor in plain muscle and thus forestalls the possibility of formation of lactic acid even when arsenates are present to accelerate later reactions in the sequence of changes.

Calcification in Rabbits.

M. MELLANBY and E. M. KILLICK (*Biochemical Journal*, July, 1926) record the results of numerous studies of rabbits fed in different ways. For eight years investigations have been made of the factors influencing the development of teeth in puppies and other animals with the object of dis-

covering the main causes of the bad teeth of civilized nations. It has been noted that the deciduous teeth of children are badly calcified to the extent of over 80% in the children examined and that there is direct ratio between structure and caries, in general the worse the structure, the more the caries. Children have been classified according to their diet into a group with a potentially calcifying diet, into a group with a poorly calcifying diet and into an intermediate group. The spread of caries in the group with a poorly calcifying diet was three times that of the group with a potentially calcifying diet. The authors tried to find what dietetic factors caused caries in animal experiments, but with little success. Recently they have found rabbits suited for such experiments. They have succeeded in finding diets which allow good growth and good general health in rabbits, but which lead to defective calcification of teeth and bones. So far they have not produced dental caries in rabbits living on these diets. Calcification is rapidly brought about in rabbits kept on these unsatisfactory foods either by increasing in the calcifying vitamin in the ration or by exposing the animal or its food to ultra-violet radiations.

Gravimetric Estimations of Micro-organisms.

H. I. COOMBS and M. STEPHENSON (*Biochemical Journal*, August, 1926) have worked out details suited for the gravimetric estimation of bacteria and yeast in cultures. A culture of *Bacillus coli communis* is made in a tryptic digest of casein of which the content of nitrogen was four milligrammes per cubic centimetre. By the method a study was made of the hourly increase in weight of the bacteria. The results showed a lessening in the rate of growth about the tenth hour. A similar lag in growth was seen with yeast at the tenth hour. Full details are given of the type of control, preparation of the filter, procedure before desiccation and mode of weighing. Only ten cubic centimetres are employed and a microbalance is used.

Hydrolysis of Starch by Amylase.

G. S. EADIE (*Biochemical Journal*, August, 1926) has made a study of the effect of concentration of enzyme on the hydrolysis of starch by the amylase of germinated barley. For substrate the author used Lindner's soluble starch, as it is thought that there is little difference in the rates of action of the enzyme on amylopectin and amylose. The enzyme was made by allowing barley to germinate for four days, by extracting with water for forty-eight hours and by subsequent dialysis. The author finds that a number of empiric formulae represent the relation between velocity of reaction and concentration of substrate, but was unable to ascertain a suitable rational formula. He further made studies of the effects of concentration of salts, of hydrogen ion concentration and of temperature on the relation between velocity of reaction

and the concentration of substrate. Some further experiments have been made with glycogen as substrate.

Antiscorbutic Fraction of Lemon Juice.

C. G. DAUBNEY and S. S. ZILVA (*Biochemical Journal*, August, 1926) have thought that it would be instructive to gain information about the behaviour of some of the inorganic constituents of lemon juice in respect to their presence or absence in the antiscorbutic fractions obtained from decitrated lemon juice by removing from it sugar and substances precipitated by alcohol and by neutral lead acetate and by precipitating the active principle ultimately with basic lead acetate. Such an active fraction contains less than one-five-hundredth of the dry matter of the original lemon juice. The juice of the lemon contains from 0.15% to 0.2% inorganic ash, while the antiscorbutic fraction contains from 0.002% to 0.003% ash. The ash was examined for nickel, boron and cobalt, of which it was found free within the limits of the tests employed. Iodine was found to be present, but iodine could be separated by dialysis from the active principle. Iodine appeared to be present in a compound of colloidal nature which did not diffuse. Phosphorus was present in the purest samples.

Metabolism in Menstruation.

RUTH OKEY and RUTH E. BOYDEN (*The Journal of Biological Chemistry*, March, 1927) have investigated the lipid content of blood in relation to the menstrual cycle. Two hundred samples of blood were taken before breakfast from sixteen women and twenty-six monthly cycles were covered. Two of the subjects were taking weighed and constant diets and the others ate the ordinary food at the college boarding house. It was found that a fall in the cholesterol content of the blood almost invariably took place during or within a few days of the menstrual period. The fall was preceded by blood cholesterol higher than the averages for the individuals concerned. If the average for each person is regarded as 100% and if each observed value is computed in terms of this average, the high points of the curve reach the 124% mark. The average low values observed were 70%. The extreme high and low values were 157% and 46%. In certain cases a tendency to a menstrual alteration in the level of fatty acid was observed. The lowest fatty acid values usually occurred later than the low points in the cholesterol curves. Lecithin values tended to be more nearly constant than those of either fatty acid or cholesterol. This meant an increase often reaching 50% to 100% in the lecithin-cholesterol ratios, usually reaching its maximum during the first two days of a menstrual period. It is suggested that the period of retrogression of the *corpus luteum* may correspond to that of the drop in blood cholesterol.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Darling Building, University of Adelaide, on April 28, 1927, Dr. H. H. E. RUSSELL, the President, in the chair.

Lead in the Treatment of Malignant Disease.

DR. BRIAN H. SWIFT read a paper entitled: "Professor Blair Bell's Lead Treatment of Malignant Disease" (see page 812).

Urological Notes.

DR. GLEN H. BURNELL read a paper entitled: "Random Urological Notes" (see page 815).

Transplantation of the Uterus into the Colon.

Dr. Burnell also showed two patients in whom he had performed the operation of transplantation of the ureter into the colon. Particulars of these operations will be published in full in a subsequent issue.

Skigrams.

DR. H. C. NOTT showed a series of skigrams. The conditions illustrated included the following: (i) Gall bladders containing opaque stones, (ii) gall bladders after the administration of tetraiodophenolphthalein, the outline of the gall bladder filled with the opaque material could be seen together with clear areas representing numerous calculi, (iii) two wrist joints in which backward dislocation of the *os magnum* had been reduced by manipulation by Dr. I. B. Jose.

A MEETING OF THE TASMANIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Hobart on April 7, 1927, Dr. G. H. HOGG, the President, in the chair.

Optic Neuritis and Whooping Cough.

DR. G. H. HOGG read a paper entitled: "Optic Neuritis as a Complication of Whooping Cough" (see page 825).

DR. D. H. E. LINES thanked Dr. Hogg for his paper and hoped that it would be published on account of the rarity of the condition. He discussed the possible causes of optic neuritis and illustrated his remarks on the causation of neuritis by an infection by referring to the condition of a patient who had recently come under his notice. The patient had suffered from *herpes zoster* of the external auditory meatus complicated by facial paralysis. The patient had presented an inflamed, swollen, tender mass in the region of the parotid gland. The meatus had been blocked and the appearance was suggestive of furunculosis. Very little discharge had been present and the mastoid appeared to be normal. Several days later a crop of typical vesicles had appeared and the facial paralysis slowly improved. He thought that the infection was in the neighbourhood of the geniculate ganglion.

Dr. Hogg in reply referred to other interesting forms of optic neuritis and particularly to hereditary optic neuritis. On account of the ignorance of the patient it was frequently very difficult to follow the family history. He was investigating three cases and hoped to report them at a later date.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Austin Hospital, Heidelberg, on April 28, 1927. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff.

Pulmonary Tuberculosis.

DR. J. F. CHAMBERS showed a female patient, aged thirty-five years, who for the past sixteen years had had pulmonary tuberculosis affecting chiefly the right lung. An X ray photograph which was exhibited, showed that the

right lung had been reduced to a contracted mass of fibrous tissue. The left lung showed profound compensatory emphysema. There was gross cardiac displacement, the apex beat of the heart being in the fifth intercostal space nine centimetres (three and a half inches) from the mid-line. Dr. Chambers commented on the cardiac displacement produced by the lung fibrosis. It might easily, on first impression have been mistaken for a true dextrocardia.

Dr. Chambers's second patient was a female, aged nineteen years. She had had extensive tuberculous lesions in both lungs and in spite of rest in bed for some months there had still been fever and constitutional disturbance. In an effort to check the severe toxæmia artificial pneumothorax had been induced upon the more involved lung in January, 1927, with an unexpectedly favourable response. The patient at the time of demonstration was afebrile. She had put on weight and her general condition had much improved. Following the pneumothorax the pleural cavity had filled to about the third rib with a simple effusion which had remained stationary at this level for the past two months in contact with a well collapsed lung. In order to facilitate lung reexpansion at the termination of the pneumothorax treatment, Dr. Chambers considered it wise to aspirate the effusion and maintain the lung in a state of collapse, if possible by air alone.

Paraplegia Complicating Pott's Disease.

MR. HUGH C. TRUMBLE showed two patients suffering from paraplegia complicating Pott's disease. The first was a boy aged fifteen years. Symptoms of spinal trouble had appeared at the age of ten in 1922. A year later signs of pressure on the cord had developed. He had been first treated on an anterior Thomas splint, but this had been abandoned because of pressure sores. He had got worse and in 1925 a laminectomy had been performed at the Children's Hospital. Twelve months after operation there had been no improvement. At this time there had been almost complete paraplegia, anaesthesia up to the level of the umbilicus, flexor spasms and automatic emptying of the bladder. The deep reflexes in the lower limbs were much increased and the plantar reflexes were both extensor. Early in 1926 he had been admitted to the Austin Hospital and since then had been treated on a plaster bed. He had gradually improved and in the middle of 1926 voluntary movement of the toes had returned and there was some improvement in sensation. At the time of showing sensation was almost normal and he could with difficulty raise both legs from the bed. There was still automatic emptying of the bladder and the reflexes in the lower limbs had not altered. Mr. Trumble pointed out that gross paraplegia, even if persisting over a prolonged period, in this case for nearly three years, did not necessarily mean that recovery would not take place. He regarded the operation of laminectomy as useless and usually harmful in most instances.

The second patient was a male, aged thirty-three years. He had had spinal trouble for many years. Signs and symptoms of pressure on the cord had appeared in 1924. These had rapidly progressed until his admission in August, 1925. He had then been extremely ill, was febrile and was considerably wasted. He had retention of urine and incontinence of faeces. The urine was foul-smelling. There were painful flexor spasms and anaesthesia up to the level of the umbilicus. The superficial abdominal reflexes were absent, the deep reflexes in both lower limbs were much increased and the plantar reflexes were both extensor. There was pronounced kyphosis in the mid and lower dorsal region. His bladder had been catheterized for eight months and there were extensive bedsores. He had been placed on a plaster bed and the bedsores were treated by strapping. After about twelve months gradual recovery had commenced. At the time of presentation the bedsores had healed and he was practically normal as regards sensation, muscular power and sphincter control. The urine was clear. The superficial abdominal reflexes could at times be obtained. The left plantar reflex was extensor and the right was equivocal. Mr. Trumble pointed out that in this case recovery had followed after more than a year of signs and symptoms of an almost complete transverse lesion of the spinal cord.

Acute Arthritis of the Hip Joint.

The next patient shown by Mr. Trumble was a boy, aged seventeen years of age. At the age of eleven he had had an acute arthritis of the right hip joint, probably pyogenic in origin, which had been drained. He had been in the Austin Hospital for several years with discharging sinuses about the joint. From one of these the complete rounded epiphysis of the femur had been extruded. Bony ankylosis had followed with considerable flexion and adduction at the joint. A subtrochanteric osteotomy had been performed and the malposition corrected. He was able to walk well and was employed as a sign writer. A series of X ray photographs was exhibited, showing the progress to the surface of the epiphysis which must have been shed at the commencement of the disease. It showed no signs of absorption. There was also massive production of new bone in the region of the hip joint, causing strong bony ankylosis.

Hydatid of the Lung.

Mr. Trumble also presented two patients with hydatid disease of the lung both of whom had been admitted with a diagnosis of pulmonary tuberculosis. The first patient was a female, aged forty-seven years. The sputum had contained no tubercle bacilli. X ray examination of the chest had revealed a small cyst about the size of a hen's egg at the base of the right lung and a larger cyst approximately nine centimetres (three and a half inches) in diameter in the left lung. On July 11, 1926, the cyst in the right lung had been easily removed through an intercostal incision, splitting the rib space widely. On July 23, 1926, the patient had coughed up membrane and an X ray picture, taken on July 25, 1926, showed that the left sided cyst had disappeared leaving only the thickened adventitia and some surrounding infiltration which was seen by subsequent skiagrams to have gradually disappeared. The patient had made a good recovery and had been discharged.

The second patient was a female, aged thirty-five years. No tubercle bacilli had been found in the sputum. X ray examination had disclosed a large cyst in the left lung. Under intratracheal anaesthesia a rib had been resected and the pleural cavity opened. Exploration with the finger had revealed firm adhesions above the opening which had then been closed and a second opening made over the adherent area. The cyst was then removed without difficulty and a drain tube inserted. Convalescence had been uneventful.

Construction of a Plaster Bed.

Mr. Trumble also demonstrated how to construct a plaster bed and exhibited a number of interesting skiagrams showing lesions of the vertebral column.

Tumour of Humerus (Ewing's Endothelioma).

DR. H. FLECKER showed a patient, a female, aged forty-three years. Five years ago she had been sent for treatment by Mr. H. B. Devine with an extensive brawny induration of the left arm and shoulder, extending from the elbow to the chest and the root of the neck, which had been coming on gradually for the previous six months. There had been no history of trauma, although the swelling was preceded for eighteen months by a good deal of pain which had been diagnosed as due to neuritis. Both the elbow and the shoulder joints had been fixed and rigid and the whole limb rendered thereby useless. A skiagram taken before treatment was shown. Dr. Brennan's report on a section of a portion of the mass taken from the deltoid region was as follows: "Fibrous reticulum with number of small spindle and round cells strongly suggestive of sarcoma." The section had also been submitted to The Registry of Bone Sarcomas in Boston, United States of America, which had classified it as "Ewing's Endothelioma." On July 27, 1922, a single dose of X radiation had been given with a voltage of 200,000. Eight days later there had been considerable improvement and by August 10 the swelling had almost disappeared and the pain and stiffness had so lessened that she had been able to do up her hair. A second dose had been given on September 18. On November 17 she had been able to play the piano. Except for slight recurrences in the neck in 1924 and in the groin in 1926 which had been treated by fresh exposures the patient had remained well.

Probable Sarcoma of the Tonsil.

Dr. Flecker's second patient was a male, aged thirty-two years. In 1923 he had been referred by Dr. R. A. Stirling with a large mass of four months' duration, filling up the fauces and interfering much with deglutition and speech, as well as large glands on each side of the neck. No microscopical section had been made. On March 13, 1923, one dose of X ray therapy had been given and had not since been repeated. A fortnight later the great bulk of the tumour masses had disappeared and normal voice had been restored. In May, 1923, he had returned to work and had been regularly employed ever since. All that had remained to indicate the original condition was a small foramen in the anterior pillar of the fauces.

Dr. Flecker also showed several patients whom he had treated for carcinoma of the breast.

Carcinoma of the Breast.

A female patient, aged sixty-one years, had been operated on in February, 1922, by Dr. Webb, who had removed the left breast for scirrhus of the inner and lower quadrant. The growth had been adherent to the skin but not to the pectoral fascia. In 1925 she had noticed a lump over the upper part of the sternum which was evidently a recurrence. Two doses of intensive X radiation had been given in August, 1925, and January, 1926. By April, 1926, the mass had completely disappeared. At the time of presentation there were small recurrent nodules over the ventral aspect of the sternum.

A female patient, aged eighty years, had suffered in 1923 from a large carcinoma of the left breast, almost ulcerating and with retraction of the nipple. It had been present for five years. It had been considered by Dr. Norman Wilson to be unfavourable for operative treatment. During the past four years, six doses of X ray treatment had been applied. The growth was very slowly growing larger, but it was claimed that treatment had to a large extent prevented ulceration of the surface and when ulcerations had occurred they had healed soon afterwards.

A female patient, aged fifty-five years, had been admitted in January, 1926, with a carcinoma of the breast of seven years' duration and a large ulcerating secondary involvement of the upper part of the right femur which caused severe pain. X ray therapy applied to the breast and to the mass in the thigh had produced some improvement and very great relief from the pain. In March, 1927, secondary deposits had appeared in the left humerus.

Rodent Ulcer of the Face.

Dr. Flecker showed a male patient who had been admitted on account of pulmonary tuberculosis. He had had a rodent ulcer on the left side of the face for several years. In the last twelve months it had progressed rapidly. On February 18, 1927, he had been given an intensive dose of X ray treatment. Improvement had been apparent one week later and in eight weeks the ulcer had completely healed.

Other Malignant Tumours.

Patients suffering from carcinoma of the oesophagus and angiofibrosarcoma of the pharynx whose condition had improved somewhat under X ray treatment, were also exhibited.

Hypertrophy of the Prostate.

Dr. Flecker's next patient was a male, aged fifty-two years. In September, 1924, he had been advised to have his prostate gland removed. In December, 1924, Dr. Murray Morton had found that the prostate as felt *per rectum* was rather enlarged, but that the bladder was well emptied with a good stream. There had been thirty cubic centimetres (one ounce) of residual urine. In December, 1924, a 34% erythema dose had been applied to the pelvis, but this had produced only slight improvement. In May, 1925, a 47% erythema dose had been given and in December, 1925, a 68% erythema dose over the whole pelvis. By July, 1926, he was very much improved and felt like a new man. He had to get up at night only once or twice instead of about four times as formerly.

Dr. Flecker pointed out that the large doses had been much more effective than the small. He also drew attention to the fact that the heavy X ray treatment must

have destroyed all the spermatozoa and their parent cells, but that the interstitial cells had been unaffected, as there had been no interference with sexual desire. In the female, however, heavy irradiation of the ovaries produced the severe symptoms accompanying artificial menopause.

Tuberculous Dactylitis.

Dr. Flecker's next patient was aged six years. In September, 1922, he had had tuberculous dactylitis of both hands with discharging sinuses. Only one dose of X ray treatment had been given to the hands and by January, 1923, all the sinuses had healed.

Tuberculous Glands of the Neck.

A female patient, aged nineteen years, had been sent to the Heatherton Sanatorium in March, 1922, with large tuberculous glands on both sides of the neck. In March, 1923, the glands were still very much enlarged. On March 15, 1923, a dose of deep X ray therapy had been applied to the whole of the neck on both sides. No further dose had been given and by May, 1924, the glands had been reduced to small hard lumps.

Dr. Flecker also showed another patient, a female, aged forty-six years, in whom large tuberculous glands had almost completely disappeared after four doses of X ray treatment.

Trigeminal Neuralgia.

Dr. Flecker also presented a patient, aged forty-two years, who had been complaining for the previous three years of symptoms of trigeminal neuralgia of the infra-orbital division on the left side. Relief had at first been obtained by alcohol injections, but latterly these had had no effect. The last injection had been given in December, 1926. In February, 1927, intensive doses of X rays had been applied about the Gasserian ganglion from four different directions. This had produced a remarkable transformation. The patient at the time of presentation was bright and cheerful, had put on over 6.3 kilograms (a stone) in weight and had no pain. There was still slight tenderness over the infraorbital foramen.

Exophthalmic Goitre.

Dr. Flecker's last patient was a female, aged thirty-four years. In October, 1923, the thyroid gland had been enlarged. The basal metabolic rate was + 13%. The pulse rate was 78 in the minute, although it had been formerly 120. She had complained of hot flushes, nervousness, throbbing in the neck and sweating of the hands and feet. On August 9, 1923, the first X ray treatment had been given. By December, 1923, she had improved considerably, had put on over 6.3 kilograms (a stone) in weight and felt much better. In July, 1925, the X ray dose had been repeated.

Pathological Specimens.

Dr. G. F. S. DAVIES exhibited a number of interesting pathological specimens.

Amyloid disease was illustrated by macroscopical specimens of the liver, spleen, kidney, suprarenal gland and small intestine. These were shown in natural colour, stained with iodine and with gentian violet. The unstained specimens showed infiltration with amyloid which appeared as waxy translucent material most pronounced in the kidneys. The spleen was of the "sago" type. Microscopical sections of each organ were also shown.

The specimens had been obtained *post mortem* from a female, aged forty-four years. She had been admitted to hospital five years previously with a tuberculous spine which had then been present for seven years. On admission there had been discharging psoas abscesses on both sides. During her stay in hospital she had suffered from occasional attacks of diarrhoea accompanied by nausea and vomiting. There had been considerable albuminuria and just prior to death much abdominal distension. The liver, spleen and right kidney had been easily palpable.

Tuberculous pericarditis was exemplified by specimens of the right kidney and ureter and heart. These had been obtained *post mortem* from a male, aged twenty-eight years. He had been quite well until five months before

his admission in October, 1926. He had then complained of frequency and urgency of micturition. He had passed urine about seven times during the day and six times in the night, but there had been no pain or scalding. He had lost a little weight. Three months before admission he had noticed pain in the scrotum and soon afterwards the right testicle had become swollen, red and painful and had broken down. On examination the right kidney had been enlarged, hard and tender. The left kidney was tender, but not palpable. Tubercle bacilli had been found in the urine. The right epididymis had been enlarged, hard and clearly demarcated from the testis and there was a sinus arising from the region of the caput. The right spermatic cord had been thickened. The apex beat of the heart had been in the fifth intercostal space ten centimetres (four inches) from the midline. The right border of the heart appeared on percussion to be at the left border of the sternum. The pulmonary second sound had been accentuated, but there were no murmurs. Subsequent X ray examination had revealed "enormous cardiac enlargement." Death had occurred on January 4, 1927.

At autopsy the right kidney manifested tuberculous pyelitis. The pelvis and calyces were lined with a thick layer of tuberculous material which extended a little into the kidney substance. The ureter was very much thickened and caseous. The heart was the seat of tuberculous pericarditis, the visceral and parietal pericardium being thickly coated with a layer of firm false membrane which under the microscope proved to be almost completely caseous. A thin layer of tuberculous granulation tissue containing many follicles was present between the heart muscle and the caseous outer zone.

Dr. Davies also showed specimens of a carcinoma of the uterus with widespread secondary deposits. The first symptom noticed by the patient had been irregular bleeding at the time of the menopause which had been neglected for four years. When she first applied for treatment the growth had been found to be inoperable.

A microscopical section of a nodule in the sternum secondary to a carcinoma of the prostate, was also shown. The nodule had been treated with radium three weeks before death. The section showed almost complete necrosis of the carcinoma cells, but the stroma was almost unaffected.

Several other specimens were also exhibited.

Polyarthritis.

Dr. H. F. MAUDSLEY showed a male patient, aged twenty-eight years. He had had gonorrhoea nine years previously. Three years before admission he had had signs of early pulmonary tuberculosis which had cleared up under sanatorium treatment and although he had had a relapse one year later, the disease at the time of presentation was quiescent. Twelve months previously he had begun to have acute pain in both hip joints and had been unable to walk. Later he had become affected by a subacute polyarthritis. The arthritis in the joints of his upper limb had improved. At the time of the meeting he was immobile from the waist downwards. There was rigidity in his lower dorsal and lumbar vertebrae and any attempt to produce movement in the hip joints appeared to cause excruciating pain. There was considerable wasting of his lower limbs. Examination of the affected joints revealed no other abnormality, no deformity and no swelling of the surrounding tissues. Skiagrams revealed no abnormality. There were no signs of prostatic urethritis and a full investigation had revealed no focal infection elsewhere in the body. Diathermy and heliotherapy were suggested as modes of treatment.

Disseminated Sclerosis.

Dr. Maudsley's next patient was a female, aged thirty-six years. She had been presented a year previously as suffering from disseminated sclerosis. At that time there had been definite weakness in both lower limbs. The superficial abdominal reflexes had been absent and both plantar reflexes had been extensor. There had been a definite intention tremor and slight nystagmus. During the previous twelve months she had been rested in bed and given arsenical treatment. The neurological signs had

disappeared; muscular power was good, the abdominal reflexes were present and the plantar reflexes flexor in type. There was a good deal of rigidity in the right upper and lower limbs, not postural, but functional in type. There was also foot drop on the right side, definitely functional in origin. She was unable to stand unaided and this disability was also considered to be functional. Dr. Maudsley drew attention to the value of rest in inducing a remission in disseminated sclerosis. He thought that, if treated by reeducation and suggestion, the patient might do comparatively well.

Epigastric Tumour.

Dr. Maudsley's last patient was a male, aged forty-nine years, who had been a quartz miner. Twenty years previously he had developed miner's phthisis, but latterly it had not given him much trouble. He had contracted malaria in 1921. At the end of 1925 he had complained of vomiting and epigastric pain, which at times was acute, but had no relation to meals. Attacks of pain and vomiting recurred throughout 1926. On examination there was in the left epigastrium a firm, slightly tender mass extending for seven and a half centimetres (three inches) into the left hypochondrium, with an easily felt edge, not notched and continuous with liver dullness. In the last six months the tumour had not increased in size. The liver to the right of the midline was not enlarged. There was no wasting. X ray examination after the administration of a barium meal had revealed nothing abnormal. The blood had failed to react to the Wassermann test. The Casoni and complement fixation tests for hydatid had both failed to yield reactions. Cholecystography showed that the gall bladder was in its normal position, faintly outlined and suggesting some malformation.

Carcinoma and Tuberculosis of the Larynx.

DR. T. G. WYNNE showed a number of patients illustrating the laryngoscopic features of tuberculosis and carcinoma of the larynx.

Optic Atrophy.

DR. MARK GARDNER showed a patient with disseminated sclerosis and a primary optic atrophy. The retinal vessels were full and there was gross nystagmus.

Disseminated Chorioiditis and Secondary Optic Atrophy.

Dr. Gardner's second patient illustrated the features of disseminated chorioiditis and secondary optic atrophy. The blood reacted strongly to the Wassermann test.

Fragilitas Ossium with Blue Sclerotics.

Dr. Gardner's last patient was a female, aged ten years. She had had thirty fractures, some occurring from such slight injury as turning over in bed. The sclerotics were slate blue in colour.

Tuberculous Spine with Calcification of the Renal Pelvis.

MR. C. J. O. BROWN showed a female patient, suffering from tuberculous disease of the thoracic spine. She had been treated for eighteen months on a Bradford frame. At the commencement of treatment she had had a right lumbar abscess drained and the sinus had healed twelve months ago. Progressive skiagrams had revealed small shadows in the right renal area, gradually becoming more pronounced. They were assumed to be spots of calcification in a healing abscess. Six weeks ago the patient had been taken off the frame and turned over on her face. She had then complained of severe colicky pain in the right loin with vomiting and tenderness suggesting a Dietl's crisis. Another skiagram of the right kidney had been taken and a fusion of the shadows previously noted was seen, giving a composite shadow completely outlining the renal pelvis, but leaving the centre clear. It was evident on comparing this skiagram with the previous ones, that the early shadows had been due to commencing calcification of the renal calyces. An examination of the urine had revealed no abnormality and at no time had there been any urinary disturbance. The pyelogram and ureterogram of the right side had been quite normal. Mr. Brown regarded the

condition as being a very slow tuberculous infection of the kidney undergoing calcification.

Renal Stone.

Mr. Brown's second patient was a female, aged twelve years, who had had a tuberculous hip for six years. She had been treated in the recumbent position. Three years previously she had complained of urinary symptoms and a skiagram had revealed a large stone in the lower end of the right ureter and several stones in the pelvis of the right kidney. The stones had been removed and the urinary symptoms had subsided. About nine months previously urinary symptoms recurred and X ray examination had shown doubtful shadows in the left renal area. About this time the child had been allowed out of bed. Frequent bladder irrigations had been given and potassium citrate was administered by the mouth. The urinary symptoms had completely subsided. The hip joint had become ankylosed in good position. Mr. Brown pointed out the risk of urinary stones developing in patients who were kept recumbent for prolonged periods.

Static or Postural Scoliosis.

Mr. Brown's third patient was a male, aged eight years, with marked scoliosis. Careful examination of the osseous muscular and nervous systems had revealed no abnormality. The child was otherwise well developed and active. It was unusual for this condition to occur at such an early age. Treatment by alternate periods of recumbency in the ventral position with lateral bands to correct the deformity and periods of exercise to strengthen the spinal muscles was being tried.

Tuberculous Disease of the Hip Joint.

Mr. Brown's last patient was a female, aged twelve years, with tuberculous disease of the hip joint. When first seen there had been gross subluxation and fixed deformity. The general condition of the child had been very poor, but this had improved greatly with rest, heliotherapy and ample diet. The joint had healed in the deformed position. There had been eleven centimetres (four and a half inches) of shortening, with 90° of flexion and adduction to the greatest possible limit, the lesser trochanter impinging on the pelvis. Subtrochanteric osteotomy had been performed and the limb fixed in full abduction and about 10° of flexion. Shortening was only six centimetres (two and a half inches) and the child had a stable leg. Further adduction could not occur, as the upper fragment was already adducted to the fullest extent possible. The limb instead of being a hindrance was of distinct functional value.

MEDICO-POLITICAL.

THE ANNUAL MEETING OF THE BENDIGO SUBDIVISION OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Bendigo Hospital on March 24, 1927, Dr. C. P. ROWAN, the President, in the chair.

Election of Office Bearers.

Office bearers for the ensuing year were elected as follows:

President: Dr. A. Lyons.

Vice-President: Dr. F. C. Burke Gaffney.

Committee: Dr. A. Lyons, Dr. H. R. Catford, Dr. Morris Jacobs.

Honorary Secretary and Honorary Treasurer: Dr. M. Jacobs.

A vote of thanks was accorded to Dr. C. P. Rowan and Dr. A. E. Ffrost for their services to the Subdivision.

Dr. W. J. Long gave a *résumé* of the recent session of the Australasian Medical Congress (British Medical Association) held at Dunedin.

NOTICES.

A SURGICAL SECTION OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION has recently been formed. The objects of the Section, as set out in the rules, are to

investigate recent advances in surgery, to discredit unsound surgical procedures, to encourage a sound surgical morality, to promote a closer alliance between surgery and surgical pathology and to hold conjoint meetings with any or all other sections of the Queensland Branch of the British Medical Association when deemed advisable and to deal with all surgical matters referred by the Branch. The office bearers for the ensuing year are as follows:

Chairman: Dr. E. Sandford Jackson.

Honorary Secretary and Honorary Treasurer: Dr. M. Geaney.

Committee: Dr. A. V. Meehan, Dr. G. P. Dixon, Dr. C. A. Thelander.

Members of the Branch, desirous of joining the Section, are asked to communicate with Dr. M. Geaney, Vulture Street, South Brisbane.

Obituary.

RICHARD JOSEPH BULL.

ON April 27, 1927, Dr. Richard Joseph Bull, as President of the Victorian Branch of the British Medical Association, together with the members of the Council of the Branch, entertained the members of the Federal Committee at dinner. It had been arranged that the dinner would not be prolonged in order that the guests might have the opportunity of attending the ball given by the Lord Mayor of Melbourne in honour of the visit of the Duke and Duchess of York. The suggestion that there would be no speeches was waived in favour of a few short ones. Dr. Bull concurred with this view. He was unwilling to allow his guests to depart without a word of warm welcome. His speech was given in a happy mood; he displayed his customary wit by recounting some delightful anecdotes from medical literature and his hospitality by many apt references to his distinguished guests. Eleven days later while in his laboratory in the University of Melbourne he was suddenly attacked by a cerebral hæmorrhage. Within a very short time he was comatose. His colleagues realized the seriousness of his condition, but they were powerless to avert the fatal termination which came at half past seven o'clock in the evening. The medical profession was quite unprepared for this sudden tragic event. He had been quick moving, active and energetic; there was no indication of an impending catastrophe.

Richard Joseph Bull was born on March 1, 1874. His father was a highly respected and well known resident of Bendigo. The son attended the Quarry Hills State School at Bendigo and on gaining a government scholarship he entered Pearce's Grammar School. He became *dux* of the school and distinguished himself both in learning and in sport. At the age of seventeen he secured an exhibition entitling him to study at the University of Melbourne for five years. He chose medicine and at the age of eighteen he gained third class honours in chemistry and second class honours in biology with an exhibition. In the following year he gained second class honours in elementary anatomy and second class honours in physiological chemistry, histology, *materia medica*, medical botany and electrical therapeutics. He again gained an exhibition. In 1894 he took first class honours in advanced descriptive and surgical anatomy, together with an exhibition and second class honours in physiology. In 1895 he gained second class honours in regional and applied anatomy and pathology with the exhibition and first class honours in therapeutics, dietetics and hygiene. He divided the exhibition. He graduated in 1896 and gained third class honours in medicine and forensic medicine and second class honours in surgery, obstetrics and diseases of women and children. He also won the Beane Scholar-ship in pathology. His record is thus a brilliant one indicating that Richard Joseph Bull possessed unusual ability in many scientific directions. After graduation he was appointed resident medical officer at the Melbourne Hospital. He held this post for six months. He was then placed by the Board of Health in charge of the State quarantine arrangements at the time of the outbreak of plague. He carried out some original investigations into

the pathology of this disease, but did not publish any papers. In 1900 he was appointed demonstrator in bacteriology. In the following year he obtained the degree of doctor of medicine by a thesis on caseous lymphatic glands in sheep in pseudotuberculosis.

He served for two years from 1903 as resident medical tutor at Trinity College and in 1905 he was appointed lecturer in bacteriology and director of the newly formed Bacteriological Laboratory. The Council of the University made a serious mistake. Instead of instituting a bacteriological department with either a professor or a full-time lecturer in charge, it neglected to make adequate provision for the teaching of this subject and for the conduct of research work. Richard Bull recognized that he would have to concede a great deal in order to establish a department of bacteriology in the University. He conceived that it would be possible to render the department self-supporting by undertaking the work of routine laboratory examinations for hospitals and private practitioners. Whether he realized from the beginning that this routine work would occupy so much of his time that it would interfere with his teaching and research, we do not know, but in any event he accepted the position because the Council was not prepared to make adequate financial provision for a purely university department. The profits derived from Richard Bull's work were handed to the University; they were used to a large extent to develop the department. The medical profession and the hospitals reaped the benefit of his skill, knowledge and hard work. He gained but little, for his colleagues would have appreciated the value of his work as highly had it been restricted to teaching and research. He found at a later date that he had to limit his original investigations on account of the large amount of routine tests and examinations that had to be carried out year after year. During the first three years he found time to study chorion epithelioma, the diphtheroid bacilli, the bacteriology of hog cholera and some special bacteriological matters encountered in the course of his work. He contributed five papers to the eighth session of the Australasian Medical Congress, held in Melbourne in 1908. About this time the prolonged quarrel between the Medical Society of Victoria and the Victorian Branch of the British Medical Association was settled. Richard Bull had joined the Medical Society of Victoria in 1901. In this year there were about twenty members of the Victorian Branch, notwithstanding the fact that it had been in existence for over twenty years. The importance and strength of the Victorian Branch had increased very materially in the seven years and it was soon realized that the profession would be in a stronger and securer position if it relied on the constitution of the Empire-wide organization than if it remained isolated under the control of a local body. From that time all the members of the Medical Society of Victoria became automatically members of the Victorian Branch of the British Medical Association. Richard Joseph Bull used the privileges of membership of the Victorian Branch to good effect and at a later date consented to stand for election as a member of the Council. He was elected in 1921. In 1924 he was asked to accept the position of Vice-President of the Branch. In December, 1926, he was unanimously voted into the President's chair. In 1925 he visited England and America and on his return his colleagues accorded him a warm welcome on the occasion of the last annual meeting of the Victorian Branch.

As a teacher Richard Joseph Bull was thorough, many-sided and lucid. He conducted classes in ordinary bacteriology for medical students, dental bacteriology, agricultural bacteriology and bacteriology and parasitology for the diploma of public health. Formerly his department was used for the teaching of bacteriology to students in veterinary science. He instituted the first post-graduate classes for medical practitioners in Victoria, several years before the Melbourne Permanent Committee for Post-Graduate Work came into being. During the war period the Defence Department called upon Richard Bull to carry out much routine and some research work in connexion with epidemic diseases affecting men in training prior to embarkment. He held special classes for men joining the sanitary corps.

Richard Joseph Bull was a man with many and varied interests. He had a wide circle of friends. He was an expert landscape gardener and a keen horticulturist. He

planned and planted his own beautiful gardens in Surrey Hills. His collection included many rare and wonderful native shrubs and plants. He had an artificial lake in his grounds which contributed to their picturesque appearance. Like all good gardeners, he took particular pride in showing his property to interested people and in presenting his friends with specimens of many of the lovely things that were growing there. He was an accomplished musician. He played the organ and the piano and was a good accompanist. He was an expert photographer and in recent years he took up cinematography. In the realm of sport he took pleasure in fishing and at one time was a keen archer.

It is said that his life was influenced to a very large extent by his mother. She stimulated his ambition to render useful service to mankind. He was a good French scholar. This proved of great value to him not only in his reading, but also when he visited Europe on four different occasions in conversing with French scientists.

The death of Richard Joseph Bull would have been deeply deplored at any time; at the present time it is doubly disastrous. This is the first occasion since this journal was established that a President of a Branch of the British Medical Association in Australia has died during his term of office. The sympathy of the medical profession is offered to his widow and the other members of his family; the profession condole with the Victorian Branch. The world of medicine feels the poorer by the sudden death of an earnest and capable student.

Dr. Newman Morris writes:

The sudden death of Richard Joseph Bull, the President of the Victorian Branch of the British Medical Association, is the occasion of sincere grief to all its members. Dr. Bull had by his work as a bacteriologist been known to the members of the medical profession throughout the State of Victoria for very many years. To him they had turned for aid in their professional work and his response was always willing and prompt.

Although a worker in the laboratory he always exhibited a keen interest in the wider aspects of medical life and in 1921 he became a member by election of the Council of the Branch. At the meetings of the Council he was regularly present and within four years he became a Vice-President and was elected as President of the Branch in December, 1926. In all the various responsibilities which he assumed, his abilities as a leader were displayed. He never missed a meeting of the Council or of its subcommittees. His management of Branch meetings was distinguished by his able and learned summing up of the discussions. When presiding over its social functions he showed a remarkable wit which enhanced the enjoyment of those gatherings. Amongst those who were most intimately associated with him, he called forth an affectionate response which is perhaps given to few men; he was eminent in the scientific work of his profession and one of the most likeable of men in his relations with his fellows.

His interests were manifold and his energy unbounded. We have lost a beloved leader whose death we mourn and whose memory will be evergreen. It will be our sad privilege to perpetuate in some tangible manner the lasting impression which he has left. To his widow and children our hearts go out in deep sympathy.

Mr. Basil Kilvington writes:

It must be about thirty years since I first met Dick Bull. He was pointed out to me—a spare, dark young man who had taken most of the exhibitions in his course, and was then doing his final year. Soon after he became a "resident" at the Melbourne Hospital and even as a student I began to appreciate his mastery of his profession, his thoroughness and the courtesy and the time and trouble he gave to explain our difficulties.

After his year at the hospital he preferred to follow a scientific and academic career rather than enter general practice.

He became a demonstrator of bacteriology under the late Sir Harry Allen and again I had the fortune to be under him for a time as junior demonstrator.

It was here, when we were together with Dr. Thomas Walker Sinclair, that I formed an admiring attachment to Dick Bull that was only terminated by his untimely death. Bull was a very hard worker. He had a struggle to finance his course and without exhibitions I doubt if he could have done medicine. He worked hard to the day of his death. As Director of Bacteriology he was beloved by his assistants and all his staff. The position was an onerous one, combining the teaching work of a professor and also a large amount of public health work and pathological examinations for practitioners.

Notwithstanding the value of every minute, he was always ready with advice and suggestions on any difficult problem brought by men in general practice. The courtesy and sympathy that he gave and this work was often gratuitous, made him deservedly popular.

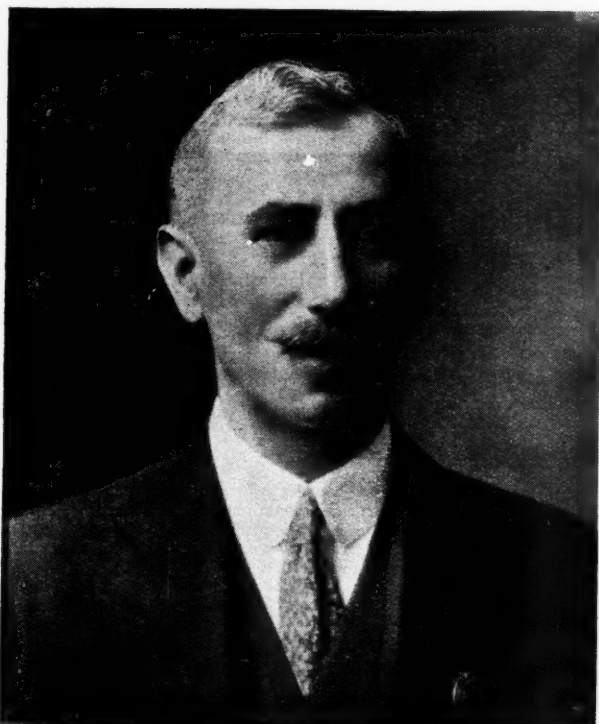
Though he was the last to parade his know-

ledge, anyone who came in contact with Bull at once recognized his ability as a pathologist and also his profound knowledge of most branches of medicine.

He had many hobbies. He had travelled widely and frequently, was an ardent angler and was an expert photographer. When the Duke of York recently honoured our University and took his LL.D. degree, Bull got most of the events with his "cinema" camera.

His home life was an ideal for he possessed a picturesque old place where he loved to spend his spare moments working with his children. The whole family were most devoted to one another.

His life ended with startling suddenness while he was at work in the laboratory. A short, painless illness while his mental powers were at their acme and when the profession had conferred on him the highest compliment possible, by making him President of our society, took us all by surprise.



We cannot realize he has gone and whenever I am at the Medical School, I still half expect to hear his quick step and be greeted with his cheerful smile.

I know of no one in our profession who has led a more ideal and useful life than Richard Joseph Bull.

Dr. Thomas Cherry writes:

A true appreciation of the debt which the University owes to Dr. Bull can only be formed by recalling the conditions under which the Bacteriological Laboratory was established. Not only was an influential section of the Faculty opposed to the introduction of any work outside its "proper function" of teaching, but no financial assistance could be obtained from the University chest. When Bull took control in 1905 the annual income of the laboratory was £1,000 of which the University contributed £100. The existence of the Department, therefore, depended on routine work being done for the hospitals and other public bodies. At first research was necessarily forced into the background. The expansion of the routine work has assumed much greater proportions by two unforeseen events—the war and the recent widespread application of the Wassermann reaction. The income of the laboratory now amounts to £4,000 of which the University contributes £1,000.

Under such circumstances Bull, a young graduate with first class prospects, elected to take the risk of building up a self-supporting wing of the University. He has done so successfully and Melbourne owes to him the possession of an institution containing within itself the resources from which further development may be made at once.

Correspondence.

SURGEONS.

SIR: IN THE MEDICAL JOURNAL OF AUSTRALIA, dated April 30, 1927, we have again as a leader of the journal an article pertaining to the credentials of surgeons.

The repetition of such statements is calculated by some men to convince others of the need for a college of surgeons. It smacks of a paradox. Whilst on the one hand we have the proposed protection of the general public and the safeguard of the standard of surgery, we have on the other hand the fact that of all the leading surgeons in Australia and in particular New South Wales, few can claim to have been planted in their chosen sphere of activity, surgery by a super-degree or brand, but rather through the vicissitudes of life by the steady upward climb and steady perfection of themselves and the complete and perfected surgeon is the successful practitioner who has ultimately confined his work to that particular sphere, surgery. Are not all our leading surgeons today, witnesses to this fact?

How comes it then that any of such men now having reached the topmost rung of the ladder pause to survey the earnest struggling, climbing coworkers beneath them and conceive the belated necessity of creating a monopoly in the surgical branch of our profession. I repeat again

it is a paradox and contrary to the guidance of their consciences to pronounce the need of a college of surgeons, when they themselves have arrived at the state of holding the public confidence in a totally different manner, that which they now condemn. Do they not recognize how they obtained their proficiency and perhaps too that there are just as many young men in this medical community who are imbued with the same principles and desires, as they themselves began with. Let them remember that "one star has reached its zenith, another is on the horizon."

The opportunities that these men have, are denied to the young graduate and practitioner today. I refer to the life tenure of the honorary appointments to the staffs of public hospitals, which effectually debars similar appointments to the younger men of today.

All honour to the men, pioneers in this patriotic work, but they are distinctly privileged to obtain the experience and with such they have earned the respect of the public. Some may have thus profited for twenty years; can any degree give this experience? No. Then why waste

time in multiplying the difficulties that beset our younger surgeons.

Again one may say: "The standard of Australian surgery will be improved." Well, the answer to this is: "It would be a wonderful world that could produce so many good surgeons as the old existing individual stimulus has produced"; or again one may say: "The brand will distinguish the good from the bad." Is everything that is branded true to its brand? Is there any more guarantee to the public in this? No; but what appears is a wholesale admission of what a poor thing the surgery of the past has been and this as we all know is not a fact. Therefore there is nothing wrong with our surgeons. The wrong has been the denial of the opportunity for the younger man to have a privileged experience, which the curriculum of the Australian College of Surgeons will not give.

What then is the best means of providing the public with more experienced surgeons? I

suggest and claim that the facts of the past support me; let there be an opening up of the avenues of post-graduate work, not as it is done at present by tedious lectures or recitations of recorded facts, but by speculative and exploratory experience by the post-graduate and practitioner and further the opening up of our big hospitals to the general use of the post-graduate and practitioner, in whatever branch he chooses to investigate. This would require no college of surgeons to perform, but the men, who hold the life-tenure positions of surgeon or physician in our public hospitals resigning and the appointment of the new men to the staff every three or five years, with no reappointment to office till the roster of men prepared to serve, work and learn with experience should be exhausted. Moreover, as a control the men who held the immediate

¹ "Anon" probably refers to The College of Surgeons of Australasia.

past positions, would act as active consultants, not passive, to the men in each succeeding groups. This would perfect to a practical degree the post-graduate who had the individual qualities that are required. This would not penalize the men who have held these positions for years, because they have the knowledge and the public confidence. This method would do more for the standard of surgery and the welfare of the community in a matter of years than all the college of surgeons will do in two or three generations.

Reformation can come from within the charmed circle of already acknowledged Fellows; let them who hold positions on hospitals resign and no longer debar the men who must follow.

Good medicine, prescription plain, taste bitter,
but the cure is there.

Yours, etc.,

"ANON."

"HEXYL-RESORCINOL."

SIR: On page 126 of THE MEDICAL JOURNAL OF AUSTRALIA, issue of January 22, 1927, there appears the following statement in the text of an article entitled "A Retrospect":

Hexyl-Resorcinol has been condemned by many urologists. V. Leonard attempts to explain its failure by pointing out that the bactericidal power of an antiseptic fluid is decreased if its surface tension is raised. By exhibiting sodium bicarbonate or by increasing the amount of fluid ingested the urine is diluted and the surface tension is raised.

Being chiefly responsible for the development of "Hexyl-Resorcinol" and its clinical application in the treatment of urinary infections, I wish to correct the erroneous impression which this inaccurate statement leaves.

In the first place, I am not aware that "Hexyl-Resorcinol" has been condemned by many urologists. Since the appearance of my first published communication on this drug in 1924, I have followed the literature very closely. The consensus of opinion on the value of "Hexyl-Resorcinol" as a urinary antiseptic thus far recorded in the literature is overwhelmingly favourable. There has been but one dissenting voice, that of H. F. Helmholz, who admits that he did not see fit to employ the drug in accordance with instructions. Dr. Helmholz is a paediatrician.

I have proved experimentally that the dilution of the urine, following increased ingestion of water or the administration of diuretic drugs, including sodium bicarbonate, interferes with the activity of the "Hexyl-Resorcinol" in the urine not only by dilution, but also by the rise in the surface tension of the urine which occurs. Those who persist in "forcing fluids" in conjunction with "Hexyl-Resorcinol" therapy, are defeating the object of the treatment. The "failure" is theirs—not the drug's.

It is apparent, therefore, that the inference contained in the paragraph quoted is very far from the truth.

Yours etc.,

VEADER LEONARD.

Department of Bacteriology,
The Johns Hopkins University,
Baltimore, April 8, 1927.

[Dr. Leonard has taken us to task in a manner that is eminently fair and moderate. Varying opinions have been expressed in regard to the bactericidal and therapeutic value of "Caprokol" (hexyl-resorcinol). In these circumstances we propose to subject this substance to bacteriological and pharmacological tests and to publish the results as soon as they are available.—EDITOR.]

THE LIST OF MEMBERS.

SIR: My attention has been drawn to your list of members and the cross swords in connexion with those who saw service overseas during the late war.

If for the late war, why not cross swords for those who have served their country overseas in any of the

Empire wars and if cross swords for those who served overseas during the late war, why not crossed thermometers for those who did not go overseas?

I am not certain that the crossed thermometer ones were not the fortunate ones. Anyway with cross swords and cross thermometers we would look somewhat the same on the printed list. I have a dim recollection of receiving an urgent call for active service at 4 o'clock on the afternoon of August 3, 1914, with just one hour to get ready and join the Sydney express leaving Melbourne at 5 p.m. We were at sea in the flagship before midnight of August 4 and on our way to New Guinea before the actual declaration of war, so that, possibly I may claim to be one of the first, if not the first civilian medical man called up in Australia. Saw service with the First Battle Cruiser Squadron and later on with the Army in France and Belgium.

Personally I think it is a great pity that this cross swords distinction has been introduced and I certainly cannot see why it is confined to men who served merely in the late war. If any distinction is made for overseas work in war time, then it should apply equally to all active service for the Empire.

Yours, etc.,

R. W. HORNABROOK.

120 Collins Street, Melbourne,
May 16, 1927.

SYMPATHETIC RAMISECTION.

SIR: Dr. A. R. Southward says in his letter in the journal of February 26 that sympathetic ramisection would reduce the tone of the abdominal wall and aggravate visceroptosis. He evidently does not understand the technique of the operation described in the issue of January 29. The rami divided were in the lumbar region and concerned only lumbar nerves, whereas the abdominal wall is controlled by the thoracic nerves.

Yours, etc.,

N. D. ROYLE.

Montreal,

April 5, 1927.

EPILEPSY IN CHILDHOOD.

OWING to lack of space the following bibliography, which was received as we were going to press, was omitted last week from the end of Dr. G. P. U. Prior's article on epilepsy in childhood.

Bibliography.

W. B. Cannon: "Bodily Changes in Pain, Hunger, Fear and Rage," 1920.

G. W. Crile: "Physical Interpretation of Shock, Exhaustion and Restoration."

W. Aldren Turner: "The Etiology of Epilepsy," *The British Medical Journal*, January 22, 1927, page 140.

R. L. M. Wallis and W. D. Nicol: "The Importance of Protein Hypersensitivity in the Diagnosis and Treatment of a Special Group of Epileptics," *The Lancet*, April 14, 1923, page 741.

Frank Coke: "Asthma," 1923.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE undermentioned has been registered under the provisions of Part I of *The Medical Act*, 1915, Victoria, as a duly qualified medical practitioner:

Anderson, Harold Gilbee, M.B., B.S., 1925 (London),
c.o. Mrs. McQueen, Natimuk.

QUEENSLAND.

THE undermentioned has been registered under the provisions of *The Medical Act of 1925*, Queensland, as a duly qualified medical practitioner:

Ralston, John Windeyer, M.B., Ch.M., 1924 (Univ. Sydney), Wowan.

Restoration to Register:

Greenaway, Thomas Sacheverell, M.R.C.S. (England), L.R.C.P. (London), 1916.

LIST OF MEMBERS.

THE following names in the list of members should have been distinguished by crossed swords, indicating active service overseas in the war:

Aiken, D., Murwillumbah, New South Wales.
Dermer, E. R., Fremantle, Western Australia.
Dunkley, C. R., Fremantle, Western Australia.
Jacobs, Alfred M., M.M., Woorooloo, Western Australia.
Pigdon, Douglas C., Mentone, Victoria.

Books Received.

RÖNTGEN RAYS IN DERMATOLOGY: A HANDBOOK FOR PRACTITIONERS AND STUDENTS, by L. Arzt, M.D., and H. Fuhs, M.D.; Authorized Translation by C. Kevin O'Malley, M.C., M.B., B.A.O., B.C.H., M.Sc. (N.U.I.), D.M.R.E. (Cambridge); 1927. London: Baillière, Tindall and Cox. Royal 8vo., pp. 216, with illustrations. Price: 18s. net.

THE FIFTH AVENUE HOSPITAL CLINICS: Edited by Joseph H. Forbes, M.D., Milton J. Raisebeck, M.D., D. S. D. Jessup, M.D., and Charles F. Tenney, M.D.; 1927. New York: Paul B. Hoeber Incorporated. Royal 8vo., pp. 336, with illustrations. Price: \$5.00 net.

Diary for the Month.

JUNE 7.—Tasmanian Branch, B.M.A.: Council.
JUNE 9.—South Australian Branch, B.M.A.: Council.
JUNE 9.—Victorian Branch, B.M.A.: Council.
JUNE 10.—Queensland Branch, B.M.A.: Council.
JUNE 14.—Tasmanian Branch, B.M.A.: Branch.
JUNE 14.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 15.—Western Australian Branch, B.M.A.: Branch.
JUNE 16.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 20.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 21.—Tasmanian Branch, B.M.A.: Council.
JUNE 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 22.—Victorian Branch, B.M.A.: Council.
JUNE 24.—Queensland Branch, B.M.A.: Council.
JUNE 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 30.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments.

Dr. Reginald Victor Adamson (B.M.A.) has been appointed Government Medical Officer at Miles, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

AUSTIN HOSPITAL, HEIDELBERG, VICTORIA: Registrar.

MELBOURNE HOSPITAL: Medical Vacancies.

SYDNEY HOSPITAL: Honorary Ophthalmic Surgeon.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Boomer Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

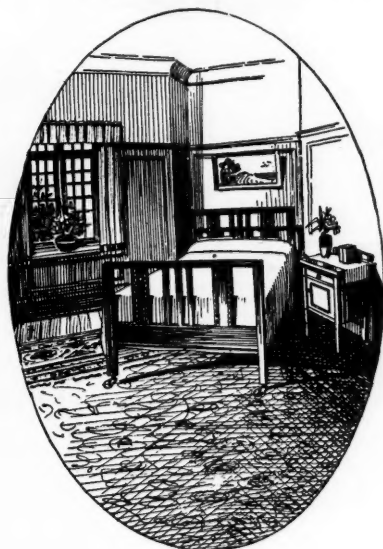
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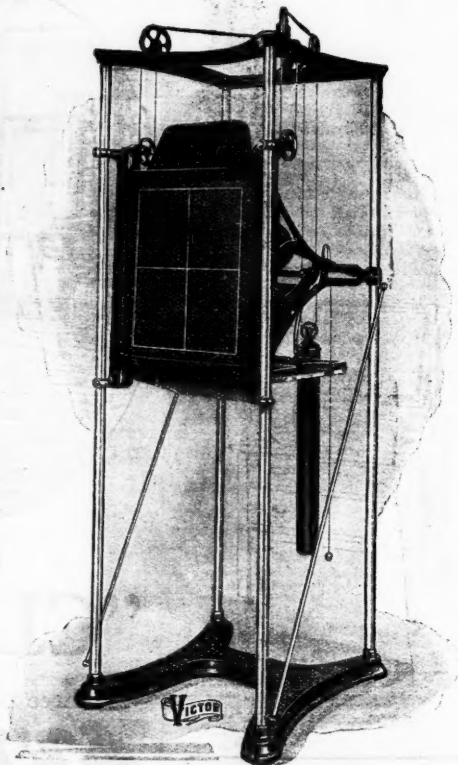
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